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Editorial Notes

The Ideal Home Exhibition

ONCE again the Ideal Home Exhibition is drawing to its close, and the members of the Gas Industry who have taken a prominent part in it will now be judging the success of their efforts. The value of co-operative exhibitions has frequently been questioned, but there can be little doubt that such composite displays as we have seen at Olympia this year do serve a most useful purpose in attracting public attention to the services that can be rendered by gas—often out of all proportion to the actual business done by individual exhibitors. This naturally has its repercussions on the progress of the Industry as whole and thereby benefits the individual participants.

That the displays in the gas section are worthy of the great Industry they represent we say without hesitation. They stand out as splendid examples of what our manufacturers so frequently do for the Industry to-day, and as such they have played a valuable part in stimulating public interest in gas, for this is the most comprehensive all-domestic exhibition that exists to-day and provides a fine opportunity for the display of domestic gas appliances. It is visited by home-lovers and those interested in modern building developments and house-planning from all parts of the country, and it is an index to all that is latest and best in domestic equipment. In addition, this exhibition is of practical interest to the Gas Industry itself, for among the exhibits are to be found several new appliances introduced to the public for the first time, together with important developments in existing apparatus. And along with all this we see some excellent examples of showmanship and standcraft which may well supply ideas for future effort.

We referred to many interesting displays in last week's "JOURNAL," and it is, we feel, not out of place, in congratulating every gas exhibitor on a noteworthy achievement, to mention again the "Mr. Therm's News Theatre," in which a selection of the latest gas films is being shown to audiences of up to 500 people at a time, the cookery demonstrations which provide a "live" interest on several of the stands, and also to the extent to which gas appliances are installed in the model houses. The latter are invariably one of the most popular features of the exhibition, and no fewer than nine of these "ideal homes" are equipped with gas apparatus, some of them containing an almost complete range of domestic appliances. It is no small tribute to the reliance which is placed on gas and the growing appreciation of the efficient, economical, and trouble-free service rendered by the modern gas appliance that so wide a selection has been made for the equipment of what may well be regarded as the last word in modern building practice. Such "unsolicited testimonials" as these often carry more weight in the public mind than any amount of direct salesmanship. They instil an association of ideas which more often than not leads to the purchase of such appliances when the new house is being equipped or when new appliances are under consideration.

More About Co-operation

IN the "JOURNAL" for March 30, commenting on a Paper by Mr. C. W. J. Bradley and Dr. G. E. Foxwell to the Institute of Fuel, we emphasized—not for the first time—the need for the closest co-operation between all coke-producing interests. During the past three or four years coke ovens of very great capacity have been erected at steelworks and at collieries; and a slump condition is evidenced by the quantity of coke which will be available at the end of this year over the requirements of the present market. The demands of the market for coke for the iron and steel industries, for the manufacture of armaments, and for export are not stable. Already there is a weakening. The Gas Industry is familiar with the inland coke market; the same cannot be said of the oven-coke producer. Co-ordination in the Gas Industry has resulted in a happy state of affairs in which it can sell more coke than it can make. The problem in front, however, is how to absorb the large quantities of oven coke which are likely to be thrown on the market. It is a problem which can be solved by co-ordinated market development.

The more this can be brought home, the better; and we welcome a return to the subject in a Paper given last week to the Midland Section of the Coke Oven Managers' Association by Mr. W. L. Boon, of the London and Counties Coke Association, and Dr. Foxwell. The general coke market has immense possibilities provided it is properly handled, and the coking industry should examine without delay the possibilities which lie in the invitation from the Gas Industry to co-operate fully in a policy of market development. This invitation has been extended repeatedly; and there must be widespread agreement with the contention of the Authors that if disaster caused by unregulated competition in restricted markets is to be avoided no time should be lost in getting all coke producers to co-operate nationally, forming a properly supported and financed coke marketing organization to operate for economic stability in trading, efficient utilization of its products, and the progressive building of its

markets. If these steps are taken, unregulated competition with price cutting can be avoided and the coke market can be expanded. As far as technical problems are concerned, the similarity of the problems which confront the coke oven industry and those with which the Gas Industry has to deal makes the more obvious the benefits to be gained by co-operation between the two carbonizing industries.

Examples were given in the Paper by Mr. Boon and Dr. Foxwell showing the expansion of the coke market through new uses which have been developed by the efforts of the technical staff of the London and Counties Coke Association, and there is no doubt that given adequate co-operative support this work is capable of great extension. The recent frosts following an early spring have caused grave damage to fruit crops—damage which could easily have been averted by the use of coke for orchard heating, in appliances developed by the L.C.C.A. The coke consumption for this purpose is never likely to be of importance as a stable market, but it is a new avenue of absorption. Then there is grass drying. Last year there were over 100 plants in operation, each a potential consumer of about 200 tons of coke per annum. As a result of L.C.C.A. development work, a furnace with an efficiency of 86%, as opposed to 30% in the old type of grass drying equipment, has been brought out, more than halving the fuel cost per ton of dried grass. Investigations in several other directions are in progress, all calculated to extend the field for coke.

Coke marketing as practised by the L.C.C.A. involves price control, co-operation with merchants, technical assistance to consumers, improved utilization, trade affiliations, extension of existing markets, and development of new uses for coke. The experience of the Association has shown conclusively the advantages to be gained from co-operative marketing. It is difficult to understand why producers of oven coke appear reluctant to join in the good work; their support would be to the mutual benefit of themselves and the Gas Industry.

Central Heating by Gas

We are glad that more attention is being paid to the gas central heating load and that many undertakings, realizing what business there is to be gained in this field, are offering gas at attractive rates for this purpose. We suggest, however, that much more could be done to develop the load. Discussing the question in the "Journal" a fortnight ago we said that though in general gas cannot on fuel cost compete with coke consumed in modern thermostatically controlled appliances, yet there must be very many instances where the user would be prepared to pay something rather more than a solid fuel installation for the benefits to be derived from employing gaseous fuel. If proper emphasis is laid on the convenience, reliability, and cleanliness of gas many consumers will appreciate that these factors are well worth paying for. We mentioned that gas at 4d. a therm is little more expensive than coke at 30s. a ton, that it compares favourably with oil at 105s. a ton, and that electricity at 0·25d. per unit is out of the picture; and we suggested that much profitable business is to be gained in the central heating field with gas at a price of about 5d. per therm. These are, of course, all-in rates. Central heating is a specialized job and its development calls for the co-operation of our Industry with the architect and builder and with the heating and ventilating engineer. In some modern blocks of flats the external walls are insulated; and the saving in heat losses effected by such insulation places gas in a most favourable position. There is good reason to advocate a special section of a gas undertaking to tackle the central heating load, but installation work may well be left to the heating engineer. The benefits resulting from good feeling between local heating engineers and gas undertakings cannot be over-estimated.

At Nottingham the Gas Department has made great strides in developing the gas central heating business. In the "Journal" just over three years ago Mr. W. L. Howe explained that at that time the Department's central heating sales had grown to 60 million cu.ft. per annum. In last week's "Journal" we published a further Paper by Mr. Howe, who this time was able to record a central heating load in the region of 135 million cu.ft.—an increase of 125% in the three-year period. The Paper, which was given to the Midland Junior Gas Association, was concerned with the heating of closed and open swimming pools. Here cleanliness is of paramount importance, and the cleanliness which characterizes the use of gas makes it the ideal heating agent for the purpose. The interest shown in swimming grows year by year, and it is gratifying to note that in the majority of open-air pools gas-fired plant is being installed. Mr. Howe included in his Paper a list of gas-fired installations of both open and closed pools which indicates the progress which is being made; but it is obvious that the Industry has much further work to do to create the desire to have the advantages associated with a clean and flexible fuel.

There are now three open swimming pools and one closed pool in Nottingham heated by gas to everyone's satisfaction. These were described in the Paper; and the Author showed how desirable it is for the gas sales engineer—we think this expression apt for those tackling the central heating load—to understand the method of operating swimming pools, to have knowledge of filtration plant, which has an immediate and important connexion with the heating plant. One of the Nottingham pools prior to 1935, for example, was operated on the fill and empty system. The pool has a capacity of 755,000 gallons, and this amount was emptied and refilled once a week through the heating season, which occupied twenty weeks. On such a system the cost of heating by gas would have been prohibitive. The Gas Department, however, recommended—and in this case actually supervised the installation of—a filtration system, which put an entirely different complexion on the gas proposition. The figures given by Mr. Howe will prove most useful to those tackling the class of business with which the Paper dealt, and they should too, we suggest, serve as a distinct source of encouragement.

Local Rates

By the time that the present issue of the "Journal" is in the hands of our readers, the Chancellor of the Exchequer will have made his Budget speech and the secrets regarding the incidence of new taxation will have been revealed. Since we have to go to press before the speech has been made, any comment we could make would be purely speculative. The imperative need for the maintenance of the existing high rate of national taxation is generally recognized and approved by the public. Industrial welfare and economic stability alike depend upon the preservation of the peace of the world, of which a fully armed British Empire is generally agreed to be the strongest guarantee.

While this is so, it is little less than deplorable that, along with the burden of an almost crushing income-tax, there should in addition be a steady upward trend in the general level of local rates. If the taxpayer is to have no relief,

surely some steps should be taken to abate the spending activities of local authorities. No one will shoulder the blame of oppressing the ratepayer, but it could scarcely be denied that the demands of the County Councils upon the rating authorities are extremely and increasingly heavy, and, as it seems to us, quite contrary to the weight of public opinion. These demands have to be met by industrialists, the majority of whom receive practically no benefit whatever from the expenditure; and the injustice is even greater in the case of public utilities which obtain no de-rating relief.

In addition to rising rates, the level of assessments is also mounting to unprecedented heights. It is true that the present quinquennial period has been extended until 1941, but certain rating authorities are making determined attempts to secure wholesale revisions of assessments at the present time. The Rating and Valuation Act provided for a revaluation once in every five years, and the obvious intention of the Act was that a valuation so made should stand for that period unless there were exceptional circumstances which would justify a substantial revision. This view of the Act has been accepted by the Central Valuation Committee, and it was obviously in the mind of the Minister of Health when he stated in the House of Commons that during the present extended quinquennial there should be no "wholesale revaluation."

If there is a clear case for a revaluation then well and good, but the attempt to obtain information in the hope that from it some slender case for an increase could be discovered is clearly contrary to rating law and practice. In our view all such attempts should be resisted. It may be that rating is not a popular subject in Government circles, but it is becoming increasingly clear that sooner or later there will have to be a cry of halt to the spending activities of local authorities. Public Utilities are profoundly dissatisfied with the existing procedure of valuation. This dissatisfaction—particularly in so far as it relates to the jurisdiction of Quarter Sessions—is growing. It is supported by the professional valuers through their Associations, and now the influential voice of Sir James Marchant is added. In his valuable and interesting letter to *The Times* of April 14, Sir James wrote: "The making of the third valuation list has been postponed by the Government for two years. May I suggest to the Minister of Health that this welcome interval should be utilized for establishing Regional Assessment Commissioners and a technical Court of Appeal to replace the present appeal to Quarter Sessions?"

That the whole question of rating assessment, especially in so far as it relates to public utilities, should be reviewed by the Government is a suggestion which we most heartily endorse.

Visits of Schoolboys to Gas-Works

In a letter published in *Chemistry and Industry* Mr. R. W. Stott, a member of the staff of the Rugby School Science Laboratory, pointed to the desirability of arranging that visits to works to see commercial processes should be included when possible in the post-Matriculation course in schools. He has found that periodical visits to works are of very great help both to the boys and to the teacher, provided the teacher summarizes beforehand the chief points in the process to be seen. As a result of these visits the boys take a keener interest in their academic work, and realize that chemistry is of real use to the community. The visits, he remarked, would entail a considerable amount of trouble and expense on the part of the firms concerned, but he suggested that industry would in the end reap the benefit. We agree that industry would benefit, and gas undertakings should encourage the idea; the expense and trouble involved would be trifling, while the science student would gain a lasting impression of how chemistry enters into the gas-making process and what a highly refined and efficient process it is. His interest in the Gas Industry would be aroused, and he would arrive at a new conception of what the unfailing gas service which is taken for granted entails in the manufacture of clean purified gas. He would realize that the Gas Industry is a great national chemical industry conducted on the most up-to-date lines. We know that many gas undertakings have collaborated with the education authorities in arranging for such visits; our suggestion is that this collaboration should be more generally extended. Short talks and suitable demonstrations are quite easy to arrange in connexion with such visits; and a free cup of tea and a bun cannot be regarded as philanthropy likely to upset a gas undertaking's balance-sheet.

Work of a Holding Company

The technical work of a holding company was the subject of a Paper by Mr. W. Hodkinson, of the United Kingdom Gas Corporation, to the Manchester and District Junior Gas Association this month; and he made out a very good case for co-ordinated control. Referring to costing systems in last week's "JOURNAL," we said that they fail if they do not yield information quickly. The same applies to the interpretation of gas making results. Mr. Hodkinson explained the system adopted by the United Kingdom Gas Corporation for maintaining records covering the activities of the constituent companies. Monthly returns of working results are submitted to a Central Department, and their examination gives an indication of the technical assistance required. To the smaller works, said Mr. Hodkinson, the very fact that they have to extract this information at short intervals from their books has proved of benefit. In the past information, which, if acted upon immediately would have saved money, lay hidden until the half year or even the year end. Again, work carried out for the smaller undertakings by a well equipped central laboratory has proved of great help. The Author also referred to the part played by the Laboratory in regard to the Corporation's policy of offering long-term hire purchase, extending to a period as long as ten years, for appliances. Interesting and useful details were given of a spiral guided holder of electrically welded construction having a capacity of 1 million cu.ft. We would call attention, too, to the good work which has been done by the Corporation in the field of public lighting. In two of the schemes undertaken electricity was displaced by gas, ten-year contracts being secured; and in one of these cases electricity had held the field for twenty years. The schemes could not have been tackled had the gas undertakings concerned been working individually.

Electric Cookers

"Only too often," remarked a contributor to the current issue of the *Electrical Review*, "is the housewife's approval or condemnation of electric cooking based on the speed at which she can boil water for making tea or cooking vegetables. To advocate that an electric kettle or special utensils are necessary often induces a prospective consumer to visit the gas showrooms immediately." Speed of cooking is, of course, a great advantage of gas, but the public like gas cooking because, in addition to its speed, it is economic and reliable, and because of the universal availability of thermostatic oven heat control. The contributor went on to say that no busy housewife can cook satisfactorily with 3-heat switching control, and that thermostats on electric cookers should be the rule rather than the exception. Thermostatic control can be applied to electric ovens at a cost such that many electrical engineers regard it as an unnecessary refinement. That the electrical interests are not having by any means an easy task in developing thermostatic control was well indicated in a recent Paper by Mr. O. W. Humphreys to the I.E.E. In this he pointed out that if radiation plays an important part in the cooking process—and radiation does play a major rôle in electric cooking—the radiating surfaces change in temperature very rapidly when the thermostat operates. Consequently the heat transfer by radiation varies between wide limits in a very short space of time. Thus the rate of heat transfer is much greater during the "on" period than it is during the "off" period, and

the only way to ensure the same total heat transfer during a given time is to employ a thermostat which operates with a very short time cycle. This involves very close control of air temperature, and a very sensitive thermostat is therefore required. With a time cycle of 4 minutes and the oven in use for 2 hours a day the number of operations of the thermostat would be about 11,000 per annum. "Very careful design and testing is necessary," said Mr. Humphreys, "to ensure that the instrument will not only function satisfactorily for the required number of times as a switch, but that it will do so without serious change in operating temperature or differential." Yet the contributor of the article in the *Electrical Review* put forward the view that the maintenance costs of electric oven thermostats need not be feared. And, to revert to speed of boiling, we would remind the contributor that the Gas Industry now has available a little domestic appliance which is capable of producing boiling water instantaneously and continuously—a service which cannot be rendered by the electricity industry, for it would require an 8 kilowatt electric heater to give the same service as the 500 B.Th.U. per minute appliance to which we refer.

Forthcoming Engagements

April.

28.—Federation of Gas Employers and National Gas Council in Scotland.—Annual Meetings, Central Station Hotel, Glasgow, at 11.30 a.m. and 2.30 p.m., respectively.
28.—Southern Association (Western District).—Commercial Meeting, Rougemont Hotel, Exeter, 2.30 p.m.
30.—London and Southern Juniors.—Visit to Beckton Gas-Works of the Gas Light and Coke Company.

There will be no meeting of the Central Executive Board of the N.G.C. or of the Central Committee of the Federation of Gas Employers in April.

May

2.—I.G.E.—Research Executive Committee, 2.30 p.m.
3.—I.G.E.—Finance Committee, 9.30 a.m.; Membership Committee, 10 a.m.; General Purposes Committee, 11 a.m.; Council, 2.30 p.m.
3.—London and Southern Juniors.—Annual Business Meeting.
3.—B.C.G.A.—Executive Committee Meeting, Gas Industry House, 2.15 p.m.
5.—B.C.G.A.—Manchester District Conference at Warrington.
5.—Midland Juniors.—Annual General Meeting. Address by R. J. Rogers.
6.—North of England Association.—Annual Meeting at Newcastle-upon-Tyne.
7.—Manchester and District Juniors.—Visit to Rochdale. Paper by H. J. Bradshaw.
9.—G.C.P.A.—Committee Meeting, 5, Victoria Street, S.W. 1, 2.30 p.m.
10.—Federation of Gas Employers.—Meeting of Central Committee, May Fair Hotel, W. 1, 11.30 a.m.; Annual General Meeting, Gas Industry House, 3.30 p.m.
10.—N.G.C.—Meeting of Central Executive Board, May Fair Hotel, W. 1, 12 noon; Annual General Meeting, Gas Industry House, 2.45 p.m.
11.—S.B.G.I.—Annual Meeting and Dinner, May Fair Hotel. Council Meeting at 56, Victoria Street, S.W. 1.
14.—Scottish Eastern Juniors.—Annual General Meeting at Dunfermline. Presidential Address of A. C. Rea.
17.—I.G.E.—Gas Education Executive Committee, 2.30 p.m.
19.—Wales and Mon. Association.—Annual Meeting under Presidency of Mr. J. Stephenson, Aberdare.
19 and 20.—Eastern Counties Association.—Spring Meeting at Boston.
21.—Yorkshire Juniors.—Meeting at Matlock. Papers by C. W. Hemmingway, A. P. Jennings, and T. W. Pickthall.
21.—Scottish Juniors.—Joint Visit to Neasden Works of Ascot Gas Water Heaters, Ltd.
26.—Midland Association.—Spring Meeting at Walsall.
31.—June 1, 2, and 3.—I.G.E.—75th Annual General Meeting.

June

17.—I.G.E.—Refractory Materials Joint Committee, Mellor Laboratories, Shelton, Stoke-on-Trent, 2.30 p.m. (*Altered from June* 16.)
23.—B.G.F.—Visit to Empire Exhibition, Glasgow.
24.—Southern Association.—Summer Meeting at Lea Bridge.
25.—London and Southern Juniors.—Summer Visit to Folkestone.
30.—Southern Association (Eastern District).—County Meeting at Croydon.

July.

22.—I.G.E.—Joint Research Committee, 2.30 p.m. (*Transferred from June* 24.)
24.—I.G.E.—Liquor Effluents and Ammonia Committee, 11.15 a.m. (*Transferred from June* 24.)

Institution of Gas Engineers

Members of The Institution of Gas Engineers are invited to participate in Visitors' Day at the Fuel Research Station of the Department of Scientific and Industrial Research, Blackwall Lane, East Greenwich, on Tuesday, May 31, from 2 to 6 p.m.

For the benefit of members attending the 75th Annual General Meeting of The Institution a special visit to the Fuel Research Station has been arranged, by kind invitation of the Director of Fuel Research, on the afternoon of Wednesday, June 1. Particulars of this special visit will be included in the Official Programme of the Meeting which will be sent to all members in due course.

Opportunity will be afforded of inspecting the laboratories and large scale experimental plants and of obtaining a general insight into the whole range of the Fuel Research work of the Department of Scientific and Industrial Research.

Invitation Cards, for Visitors' Day on May 31, which are necessarily limited in number, will be required, and requests for them should be sent, before April 30, to the Secretary of The Institution, 1, Grosvenor Place, S.W. 1, for transmission to the Director of Fuel Research.

International Engineering Congress, Glasgow, 1938

Members of The Institution of Gas Engineers are reminded that the International Engineering Congress, in which the Institution is co-operating, will be held in connexion with the Empire Exhibition at Glasgow from June 21 to 24.

At the Technical Session on June 22, on which date a visit of the British Gas Federation has also been arranged, an Address of special interest to gas engineers will be given by Sir David Milne-Watson. Mr. J. Keillor, Engineer and Manager of Vancouver, B.C., Gas Company and Past-President of the Canadian Gas Association, will also give an Address dealing with Gas Engineering, probably on the same date.

In addition, Addresses will be delivered by outstanding British and foreign engineers dealing with various branches of engineering.

Many foreign delegates are attending this Congress and it should prove to be a great opportunity for meeting engineers from all parts of the world and of exchanging ideas.

The Registration Fee is 45s., which entitles the member to attendance at the Congress, badge, handbook, admission to the Exhibition, receptions, visits to works, excursions, and a volume of Proceedings. Those intending to register as members of the Congress should make application without delay to the Hon. General Secretary, Mr. P. W. Thomas, International Engineering Congress, 39, Elmbank Crescent, Glasgow, C. 2, and in any case not later than May 31.

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Members of The Institution of Gas Engineers will be welcome at a meeting of the Institution of Mechanical Engineers on Friday, April 29, at 6 p.m., at the Institution of Mechanical Engineers, Storey's Gate, S.W. 1. An Informal Discussion will take place on "How to Use Steam Efficiently for Power and Process," and will be introduced by John E. Belliss, A.I.Mech.E. Tickets can be obtained from the Secretary of The Institution of Gas Engineers.

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Members of The Institution of Gas Engineers will be welcome at the 44th James Forrest Lecture to be held at the Institution of Civil Engineers, Great George Street, S.W. 1, on May 3, at 6 p.m. The Lecture will be delivered by Sir Frank E. Smith, K.C.B., C.B.E., and is entitled "Disorderly Molecules, Refrigeration, and Engineering."

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Members of The Institution of Gas Engineers will be welcome at a Chadwick Public Lecture on Thursday, May 5, at 5.30 p.m. at the London School of Hygiene and Tropical Medicine, Keppel Street, W.C. 1. The Lecture will be given by Professor Ernest Barker, Litt.D. (Camb.), on "The Community Centre in Relation to Public Health and Public Welfare."

Personal

In our reference last week to the South of England representation of Messrs. William Sugg & Co., Ltd., we regret that there occurred a misspelling of Mr. E. W. NICOL'S name.

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Mr. KENNETH C. REES, who has been for the past eight years with the Wandsworth and District Gas Company, has been appointed Watford Works Engineer to the Watford and St. Albans Gas Company. Mr. W. A. EVETTS, whose place he takes, has been appointed to the position of Production Engineer to the Company.

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Mr. J. R. BOADLE has retired through ill-health from the post of Assistant Gas Engineer at Workington after forty-eight years' service.

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Mr. E. J. FILLERY, Assistant Engineer and Manager to the Newark Corporation Gas Department, has been appointed Assistant Gas Engineer to the Hindley District Council.

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Mr. A. F. COLLIESON, of the Gas and Water Departments of the County Borough of Wallasey, has been selected out of a large number of applicants for appointment by the Spalding Urban District Council to the post of Assistant Engineer and Manager of the Gas and Water Departments. Mr. Collieson was specially selected in 1932 by the Director of Education for training and an apprenticeship in Gas and Water Engineering in the Wallasey Undertakings, on the completion of which, in 1935, he was promoted to the post of Junior Technical Assistant on the Engineering Staff in the Laboratories, Water Examination Department, and Drawing Offices. During the past three years Mr. Collieson has carried out extensive work in connexion with schemes of extension and modernization of the Wallasey Gas and Water Undertakings.

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Mr. DANIEL CAMPBELL, Manager of the Kelty Gas Company, has been presented with a barometer and grandfather clock by the Directors and employees of the Company on the occasion of his silver wedding. The Vice-Chairman of the Company, Mr. W. Izatt, presided.

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The wedding took place quietly at Edinburgh on Saturday of Mr. CHARLES C. WALMSLEY, General Manager and Secretary of the Sunderland Gas Company, and Dr. Jean Weir Russell Paton, Assistant Medical Officer of Health at Worcester.

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Mr. and Mrs. A. B. WALKER, who formerly resided at Wallsend, where Mr. Walker was Engineer to the Wallsend and Walker Gas Company before it was amalgamated with the Newcastle-upon-Tyne and Gateshead Gas Company, celebrated their golden wedding on April 25.

Obituary

We regret to announce the death of Mr. WILLIAM WOOD, A.M.I.Mech.E., on April 18. He was a Director and General Manager of Messrs. John Roscoe & Co., Ltd., Gas, Water, and Mechanical Engineers, Manchester, for nearly thirty years.

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The death has taken place of Alderman HARRY CARVER, who was a former Chairman of the Leicester Gas Committee, at the age of seventy-seven.

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We regret to announce the death on Saturday last of Mr. F. W. CHURCH, a Director of the Gas Meter Company, Ltd. Mr. Church, who was in his 79th year, joined the Company in 1873 and retired in 1923 from the position of Secretary, which he had held since 1896. On his retirement, Mr. Church was elected to a seat on the Board of Directors and had regularly attended meetings up to the date of his death.

Bomb Calorimeter Thermometers

The British Standards Institution has just issued a B.S. Specification for "Bomb Calorimeter Thermometers" (B.S. No. 791-1938). This specification is intended to provide a series of thermometers which will be suitable for use in the majority of bomb calorimeters on the market.

In general, these thermometers will be used at a fixed immersion of the order of 1,500 mm. in liquid, although a considerably greater amount of the stem will be enclosed in the lagging of the calorimeter. Since it is the normal practice, however, to work with the calorimeter at a temperature close to that of the atmosphere surrounding it, the thermometers have been specified for standardization at total immersion.

Copies of this new specification may be obtained from the British Standards Institution, 28, Victoria Street, London, S.W. 1, price 2s., or 2s. 2d. post free.

Women's Gas Council

Annual General Meeting.

The Third Annual General Meeting of the Women's Gas Council is being held to-day at 3 p.m., at Gas Industry House, 1, Grosvenor Place, London, S.W. 1. The chair is being taken by the Dowager Lady Nunburnholme, J.P. The Business Meeting, at which the Annual Report is being presented and President, Vice-Presidents, and Executive Committee elected, is to be followed by an Address on "More Women in Public Life?" by the Countess of Limerick.

National Union of Teachers at Margate.

Miss K. M. Halpin addressed the Domestic Science Section of the National Union of Teachers Conference at Margate last week. Her speech was followed by four of the Gas Industry films, "Pots and Plans," "Smoke Menace," "How to Cook," and "Kensal House." Miss Halpin explained how these films illustrated the four main branches of the work of the Women's Gas Council. She said their great aim was to educate the housewife, and suggested that the time might arrive when degrees would be given to wives who had solved the problem of running their homes efficiently, retaining their good looks and attractions, and at the same time could prove they were taking an intelligent interest in the affairs of the community generally. This would mean fewer self-centred neurotic women and more happy, good-tempered husbands.

As a first step towards this end Miss Halpin advocated a compulsory one year's course in Domestic Science for all girls before leaving school.

Ossett and Horbury Reach Agreement

A settlement was announced when the Select Committee of the House of Commons, presided over by Sir Alexander Russell (Con., Tynemouth) met on April 11 to give further consideration to the Ossett Corporation Bill, under which Ossett Corporation sought power to vary the agreement for the supply of gas to Horbury Urban District Council.

Under the Bill, Ossett Corporation proposed to amend the gas agreement so as to provide that in arriving at the quarter share of the surplus on the Undertaking due to Horbury, the Corporation should be allowed to take into account the sinking fund and certain other expenditure.

The committee adjourned for three-quarters of an hour to allow the parties to consult and when they resumed the settlement was announced by Mr. Thorpe.

Horbury are prepared to put an end to the agreement scheduled to the 1900 Act, which would include, *inter alia*, their rights to surplus profits. In consideration of their so doing, the Ossett Corporation undertake on April 1, 1939, after the Royal Assent had been given to the measure, to pay a sum of £6,000 to Horbury. Ossett, would, of course, honour their obligations to Horbury up to March 31, 1939, when another payment was due.

Severn Valley Gas Corporation

Second Successive Dividend Increase

The Directors of Severn Valley Gas Corporation, which controls 24 West of England Gas Undertakings, recommend a final dividend of 2½%, less tax, on the ordinary shares of the Company, making with the interim dividend already paid a total dividend of 5½%, less tax for the year. This compares with a total of 5¼%, less tax, paid last year and is the second successive increase in dividend announced by this Company. Total net revenue for the year ended March 31, 1938, after loan interest and all other expenses, including taxation, shows a substantial increase of £47,523 against £39,897 in the previous year. After payment of the preference dividend for the year and the interim ordinary dividends and after providing for the final dividend recommended on the ordinary shares and for a dividend of 6%, less tax, on the deferred shares, the carry-forward to next year is £10,056, compared with £8,072 brought in. The accounts disclose a liquid position and no loans are now outstanding to bankers. The issued capital is £1 239,422, of which £562,115 is in 4½% cumulative preference shares of £1 each, £577,307 in £1 ordinary shares, and £100,000 in £1 deferred shares. Investments in 24 subsidiary companies amount to £1,236,925 compared with £1,158,494 last year and the balance-sheet total is £1,307,638 against £1,182,208. Included with the accounts is an interesting table which shows the exact disposition of the Corporation's holdings in subsidiary companies.

News of the Week

The Annual Congress of the Czechoslovakian Gas Association will be held on May 25, 26, and 27.

The Erection of New Showrooms, at a cost of £9,750, is to be proceeded with by the Falkirk Town Council.

An Extension of Limits of Supply is one of the objects of a Special Order for which the Bude Gas Company intends to apply to the Board of Trade, under the Gas Undertakings Acts, 1920 to 1934.

For Showrooms, the Bury Gas Committee has resolved that a sub-committee be instructed to consider a scheme for the adaption of the Broad Street premises and that an architect be engaged to prepare preliminary plans and estimates.

Adhering to its Previous Decision, the Bury General Purposes Committee has decided to heat the Town Hall by gas-fired boilers. A letter to this effect will go to the Ministry of Health, which suggested the system of heating should be by coal-fired, instead of gas-fired, boilers.

Messrs. Newton, Chambers, & Co., Ltd., report that net profits, after taxation, for 1937 were £105,758. The Directors propose to pay a final dividend of 10%, making 15% for the year, to transfer £25,000 to capital sinking fund reserve, and the balance forward is £80,925. The annual meeting is being held to-day.

Sales of Appliances during March by the Burnley Corporation Gas Department included: 209 cookers, 17 fires, 99 boilers, and 181 water-heaters, a total of 506 against 479 in the same period last year. Other appliances fixed were: 10 cottage sets, 9 grillers, 3 gas irons, 12 boiling rings, and 208 sundries. The value of sales from April 1, 1937, to March 31, 1938, was £40,689 against £38,100 during the previous year.

The Factories Act, 1937, lays down certain conditions for provision for heating and ventilation, lighting, clothes-drying, and hot water facilities in the premises that come within its scope. The B.C.G.A. has published an issue of "A Thousand and One Uses for Gas" (No. 286) which shows very effectively how the use of modern gas apparatus will enable premises to comply with the Act in an efficient and economical way.

The Extent of the Fire which occurred recently at the Works of Messrs. Stoves, Ltd., at Rainhill, was greatly exaggerated in the report we received and published last week. We are glad to be able to state that the damage was much less extensive than our previous information led us to believe and has not affected production or the prompt execution of orders. No worker has been thrown out of employment, and business is proceeding as usual.

A Bulk Supply of gas to the area of the Ennerdale Rural District Council is to be given by the Workington Gas Department. A sub-committee has considered a memorandum prepared by the Gas Engineer upon the Ennerdale Council's application for a supply to their area pending the coming into operation of the Corporation's scheme for taking a bulk supply of coke oven gas from the United Steel Companies' works. Gas is to be supplied to the Ennerdale area in the interim period at a price of 1s. 4½d. per 1,000 cu.ft. of a calorific value of 450 B.Th.U.

Addressing the Truro Chamber of Commerce on April 13, Mr. W. R. Oliver, Display Officer of the British Commercial Gas Association, said that Press advertising provided the broadest and most far flung means by which to make a national or world-wide appeal. It taught the public what to buy and had been the means of establishing standards both of quality and of price. It had definitely educated the people of this country up to a better standard of living and had shown them how to save labour, to make life easier, and to get greater comfort and increased enjoyment.

The Palestine Gas Company, which is the distributor of Shell Butagaz for Palestine and neighbouring countries, now plans to manufacture room heaters and water heaters, the use of which is a recent development in the country. For a long time to come the import of gas appliances will be essential to Palestine dealers, more especially as gas is rapidly taking its rightful place in provision of illumination, heating, and power. With the erection of the Municipal Gas-Works at Tel Aviv, to which reference has already been made in these columns, the demand will be all the greater, for the city has a population of 200,000 inhabitants, nearly all of whom are accustomed to European standards.

New Plant to be installed at the Helensburgh Gas Department's Works includes a Humphreys & Glasgow carburetted water gas plant at a cost of £8,000 and a coke-handling plant costing £4,000.

A Series of Cookery Demonstrations arranged by Dunbar Gas Commissioners was given during the past week by Miss J. T. M. Wason in the travelling showroom of Messrs. R. & A. Main, Ltd., at the Castellaw grounds. The opening ceremony was performed by Bailie J. R. Hannan, Gas Convener.

The Annual Report of the Directors of Messrs. C. & W. Walker, Ltd., for the year ended Jan. 31, 1938, states there is a profit of £28,754. A dividend is recommended on the ordinary shares of 10% and a bonus of 8¾%. A sum of £2,500 is allocated to general reserve and £9,341 carried forward. The meeting is being held to-day.

Messrs. Parkinson & Cowan, Ltd., announce that the preliminary accounts for 1937 show that the recovery of the past few years has continued and that in the aggregate earnings of subsidiaries further improved. After adding to the reserve the Directors, at the Annual Meeting to be held on May 27, will recommend an ordinary dividend of 3%.

The Water Gas Plant at the Tradeston Works of the Glasgow Corporation is to be remodelled at a cost of £10,380 as part of a scheme for increasing the productive capacity of the Works. The plant was erected by Messrs. Humphreys & Glasgow, Ltd. The scheme also provides for the modernization of the purification plant at a cost of £18,209. It is estimated that these Works will enable the Department to increase its daily output by 1 million cu.ft.

Messrs. John Thompson Engineering Company, Ltd., state that trading profit for 1937 was £52,105, to which is added £103,154 from dividends (less tax) declared by subsidiary companies, giving £155,259. Appropriations include £16,750 for income-tax and N.D.C., Directors' fees £1,129, and investments reserve £4,250. The sum of £13,113 was brought forward. The Directors recommend a final dividend on ordinary shares of 12½%, less tax, making 17½%, and the placing to dividend reserve of £25,000, leaving £44,973 to be carried forward. Meeting, April 26.

A "Pure Reflection Fire," claimed to have more than twice the efficiency of an ordinary domestic grate and to produce a larger zone of warmth comfort than any other form of radiant heating, was demonstrated at the City and Guilds College, London, last week. The pure reflection fire has been developed by the Research Department of the Combustion Appliance Makers' Association (Solid Fuel), and the South Wales Coal Owners, for the use of Welsh smokeless coals. The whole fire is built of steel and aluminium, including the radiants which distribute the heat into the room. It has many interesting and novel features. Although an open fire without doors or shutters, it burns continuously day and night without re-lighting, and is fed from a hopper which, it is stated, only needs recharging once a day. The fire is combined with a boiler which provides sufficient hot water for the needs of an ordinary house, or, alternatively, can heat two other rooms by means of radiators.

North British Association

Nominations for Ballot List.

In our report on April 13 of the Spring Meeting of the Association we stated that the following new members were elected: Messrs. J. W. Beveridge (Troon), A. Jamieson (Johnstone), D. D. Melvin (Edinburgh), D. Morton (Arbroath), P. Low (Elgin), and R. Gavin (Montrose).

These were, of course, the nominations for the ballot list for election of members to the Council at the Annual General Meeting. The mistake in reporting is greatly regretted.

Gas for the Coatbridge Swimming Pool.

Provost J. Tennent, in his civic welcome, referred to the fact that the Coatbridge Town Council had arranged for their new municipal swimming pool and public baths to be heated by gas. He is reported as having said that the basic rate for the baths worked out at 2s. 8d. per 1,000 cu.ft. Actually the basic price is 2·8d. per therm.

Cambridge Kitchen-Planning and Couplet Competitions

The prizes in connexion with the "Plan a Kitchen" and Couplet Competitions organized by the Cambridge University and Town Gas Light Company were presented on April 6 by Mrs. Saville Peck, Mayoress of the Borough. In his opening remarks the Chairman, Mr. J. Hunter Rioch, Engineer and Manager, who was supported by Mrs. Eileen Murphy, Home Service Director of the B.C.G.A., stated that the art of kitchen-planning had been stimulated by the competition. The prizes consisted of a gas cooker, which was awarded to a lady who had not cooked by gas before, a gas washing machine, and a gas water heater, which was won by a mere male. Gas irons were also given as consolation prizes. In making the presentations, the Mayoress congratulated the winners, and expressed her agreement with the comments of the Chairman concerning wise kitchen-planning.

In the couplet competition the entrants were invited to supply a final line to the incomplete verse:

> Of a certain young wife we've a story to tell,
> Her cooking was poor, and her husband unwell;
> So out of the house the old cooker they hurled,

Prizes were given for the following efforts: "Dr. Therm they consulted—result, a New World;" "And welcomed with rapture the perfect New World;" and "'Eureka!' they cried, 'We will have a New World.'"

The Distribution System and Corrosion

At the Soil Corrosion Conference convened last year by the National Bureau of Standards, Washington, U.S.A., Mr. C. C. Challis, Controller of Testing and Research, Australian Gas Light Company, contributed a comprehensive Paper on the mitigation of corrosion on his Company's distribution system. The Paper was based on the experiences of, and investigations conducted by, the Company and was the result of the co-ordinated efforts of a number of members of the staff.

The field covered by the Paper was a very wide one. Divided into three main parts the contribution dealt with a survey of stray current electrolysis conditions, tests of corrosiveness of Sydney soils, and pipe materials and pipe coatings. Details were given of electrical drainage, its successful application to a 4 in. steel main 10 miles in length. The Paper also included an account of the experience of the Company with concrete coatings for pipes; and in view of the promising nature of trials carried out in this direction the Company have tentatively adopted the practice of protecting service pipes and mild steel mains with cement coatings. The Author gave particulars of the method employed for applying the coating to mild steel pipe *in situ*. The Paper certainly reflected great credit on Mr. Challis and the Australian Gas Light Company.

Successful Trades Exhibition at Birmingham

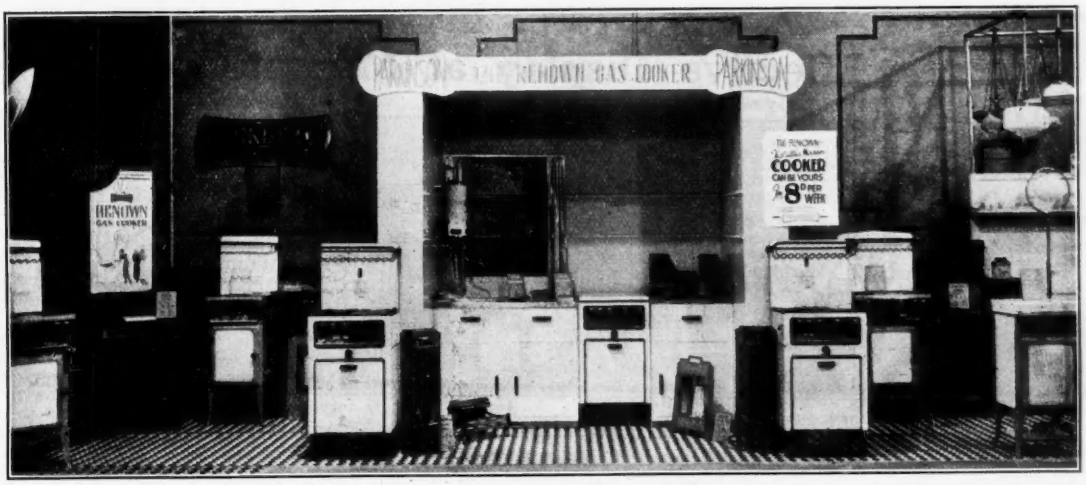
Orders to the value of over £3,000 were received in the first four weeks by the Birmingham Gas Department as a result of this comprehensive display at the National Trades Exhibition at the Bingley Hall which opened for a six weeks' run on March 14. All the orders were for hire purchase or direct sale, and included 121 cookers, 60 water heaters, 51 wash-boilers, 29 fires and radiators, and 6 refrigerators. Such results are all the more satisfactory in view of the continued fine weather which militates against attendance at exhibitions of this nature.

Natural Gas "Struck"

According to a local correspondent natural gas in considerable quantity has been "struck" by the d'Arcy Exploration Company, Ltd. (a wholly owned subsidiary of the Anglo-Iranian Oil Company, Ltd.), in its Cousland No. 1 test well, which is situated near Dalkeith, in the county of Midlothian, about seven miles south-east of Edinburgh.

The gas, it is announced, was encountered in sandstones of the oil shale group extending from a depth of 1,582 ft. to 1,640 ft. from the surface. Short tests of the upper and lower sections of this zone have proved an initial gas production of at least 4 million cu.ft. per day. The intermediate portion of the zone, the sandstones of which are potentially productive, has not been tested.

A Parkinson Display at Tamworth



This display was arranged by the Parkinson Stove Company at a recent exhibition held by the Tamworth Gas Company in the Assembly Rooms, Tamworth.

Gas Supply in Paris

Progress Reported

Since the beginning of 1937 the supply of gas in the French capital has been carried out by a new Undertaking known as the Compagnie du Gaz de Paris which took over the plant of the former concern known as the Société du Gaz de Paris. As a result of a change in the Company's financial year, the report lately issued only covers the eight months ending with Aug. 31 last, during which period the production of gas amounted to 11,172,967,800 cu.ft., a total which would appear to indicate a slight falling off, the monthly average output working out at 1,396,620,980 cu.ft. as against 1,437,369 430 cu.ft. during 1936. The number of consumers increased from 1,024,676 to 1,028,998. Approximately 21½ miles of new mains were laid during the year.

The report also mentions that numerous industrial gas-utilizing installations were carried out during the year as the result of the special laboratory set up by the Company a few years ago, which is at the service of engineering and other manufacturing concerns for experiments in solving any special problems that may arise. Good progress is also being made with the installation of gas cooking appliances in hotels, restaurants, and other large establishments, as also in bakeries and cake-making shops. Satisfactory progress also continues to be made with the installation of cooking and other domestic gas-using appliances in houses and flats. The campaign in respect of the use of gas-operated refrigerators continues to give good results, a total of 444 having been installed during the eight months as compared with only 379 during the whole of 1936.

A New House Organ

A welcome newcomer to the ranks of house journalism is *Gas News*, the organ of the Ashton and the Mossley and Saddleworth Gas Companies. Its production was the logical outcome of the desire of both these Companies to establish closer contact with their consumers, and in his editorial notes the Editor, who is Mr. G. Douglas Gill, Sales Manager of the Ashton Company, cordially invites suggestions from consumers; if they wish, he says, let them criticize, for the Companies will thrive thereon, inasmuch as just criticism enables them to review their present methods and see matters through the consumers' eyes. But we feel sure those Companies can safely invite criticism without fear of challenge, for the publication of *Gas News* but sets a seal on their already very high standard of service.

The publication will be issued quarterly, and the first number gives very bright promise of excellent reading matter to be found in subsequent issues. Articles contributed to the first number include "Good Citizens—Women *v.* Men," by Mrs. Eileen Murphy, B.C.G.A. Home Service Director, and "Exercises for Those with Sedentary Occupation," by Mr. T. Bowen Partington, F.I.L., F.R.E.S. Many "wrinkles" for the fair sex are to be found in "Items of Interest" and elsewhere, while many "pithy" anecdotes pleasantly surprise the reader by, quite decorously, popping up here and there to give that tonic balance, hard fact and light fiction, which is so essential in the pages of any publication that has good public relationships to maintain and foster.

Successful Chertsey Exhibition

"Full House" for Demonstrations

There was a "full house" at the final session of the cookery demonstrations and gas exhibition recently arranged by the Chertsey Gas Consumers' Company, at the Constitutional Hall, when the winners of the prizes in the cake-baking competition were announced and the awards distributed by Miss Eastaugh.

There were 104 entrants in the adult section and 29 in the children's class, and Miss Hocken (one of the demonstrators), who was a judge, commended the high standard of the cakes, and said the children's efforts were particularly good.

In proposing a vote of thanks to Miss Eastaugh, Mr. F. G. Matthews (Engineer and Manager) congratulated the prizewinners, and thanked all who had entered. The exhibition had been a record one, and larger numbers had attended the demonstrations than the previous year, while a greater number of sales had been effected. Mr. Matthews also thanked the demonstrators who, he said, had carried out their part of the programme very well indeed, Messrs. Wright and Messrs. Cadbury, the staff, and all who had done anything in connexion with the exhibition.

Miss Eastaugh, in reply, had to confess that she had never made a cake in her life, and she was afraid she could not do so. It made her feel ashamed when she saw such an array of splendid cakes. Those who had not won prizes had the consolation of knowing they had made their week-end cake. Concluding, she said it had been a pleasure for her to distribute the prizes, and she was pleased to hear that the exhibition had been so successful. Miss Hocken also briefly acknowledged the vote of thanks.

Scottish Eastern Juniors

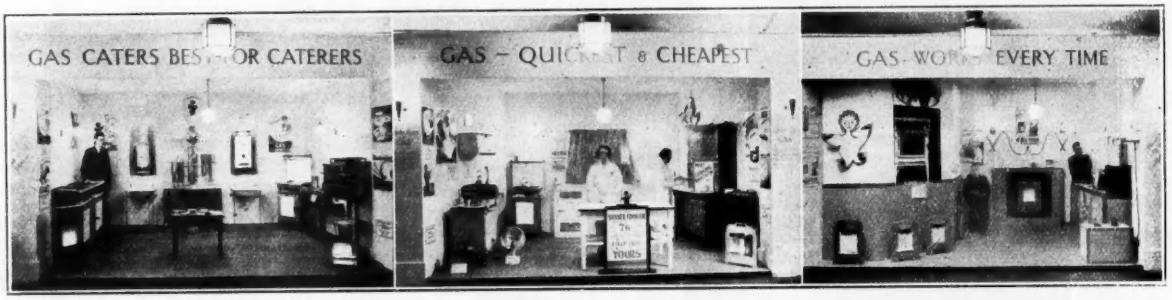
On Saturday, April 16, the Scottish Junior Gas Association (Eastern District) visited the Aitken Colliery of the Fife Coal Company, Ltd. The visitors were met by Mr. George Jenkins, Preparation Manager, and members of his staff, who acted as guides to the party on the tour of the plant. Inspection was made of the washery, engine rooms, and also the central electricity generating station which provides the whole of the current for the neighbouring collieries of the Company, 1,500,000 units being generated per week.

After a tour of the pit-head, members were conveyed to the Central Laboratory of the Company in Cowdenbeath, where the various pieces of apparatus were explained. The visitors then adjourned to the Canteen, where they were entertained by the Company at tea.

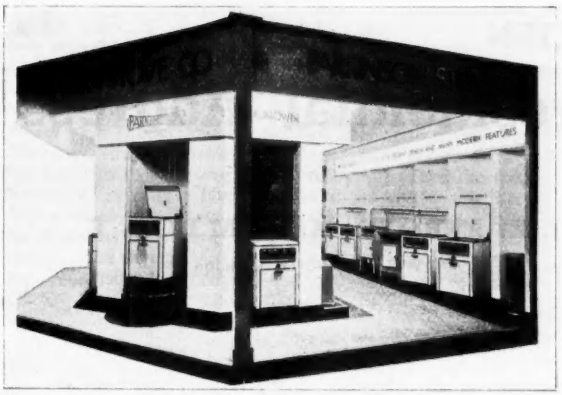
Mr. JENKINS offered a welcome to the Juniors, and in the course of his remarks mentioned the new Colliery the Company were constructing at Comrie. This, he hoped, would be working to normal output in about three years' time and would be one of the most modern collieries in the country. He extended an invitation to the members of the Association to visit the plant when it was in normal working condition. He then introduced Mr. I. COCHRANE, who gave a short Paper on "Coal Analysis."

Mr. REA (President of the Association) thanked Mr. Jenkins and his staff for their hospitality and kindness in showing them round the Colliery, and Mr. Cochrane for his Paper.

Effective Display at Margate



This display was staged by the Isle of Thanet Gas Light and Coke Company at the Seventeenth Annual Exhibition held in the Pavilion and Winter Gardens, Margate, recently. It will be seen that each section of the display deals with a different aspect of gas usage, the centre piece comprising a model kitchen where demonstrations were given several times each day. A feature of the stand was the well-conceived slogans, and the whole display attracted a great deal of public attention. Main's moving picture screen was set in the door of one of their cookers, while a model gas-works was exhibited in the same section.



FURTHER VIEWS FROM THE IDEAL HOME EXHIBITION

The photographs reproduced on this page show two further attractive stands at the "Daily Mail" Ideal Home Exhibition—those of the Parkinson Stove Company, Ltd., and Sidney Flavel & Co., Ltd., whose displays were referred to in the "JOURNAL" last week.

Athletic and Social

Cambridge Social and Dance.

The third and final social and dance arranged by the Indoor Games Committee of the Cambridge University and Town Gas Light Company's Recreation Club on April 9, met with good support. Dances, old and new, mingled with games and competitions, provided entertainment for a wide variety of tastes, and the friendly atmosphere which prevailed was of great encouragement to the organizers and reflected favourably upon the excellent spirit shared by those engaged in the Company's work. Violin solos were contributed by Mr. Kenneth Cross, and the dancing of June Tarrant and Vera Evans was again a popular feature.

Hampton Court Presentations.

Sports trophies won during the year and long-service certificates were presented at the recent annual dinner of Hampton Court Gas Athletic Club. There was a company of well over a hundred and the chair was taken by Mr. C. W. Kent (Chairman of the Directors and President of the Club). Among others present were Alderman E. Ollis (Mayor of Twickenham) and Messrs. J. de R. Kent and E. M. Wood (Directors), C. T. Price (Engineer and General Manager), H. J. Hodder (Assistant Engineer and Manager), and M. C. Lamb (Secretary).

The Sports Club has enjoyed a remarkably successful football season, having played 18 matches, without losing any and drawing only in two. They have scored 71 goals and only 28 were scored against them. A happy feature of the evening was the presentation of an inscribed barometer to Mr. L. Turner (Secretary of the Football Section) in appreciation of his work. The presentation was made by Mr. C. T. Price, who said they all knew how Mr. Turner worked and the members felt they could not possibly let the occasion pass without making some recognition to him.

"The Visitors" was proposed by Mr. Price, who said they were pleased to welcome among them two new Directors, Mr. Kent and Mr. Wood. They were also pleased to have the Mayor with them again. It was his second visit during his period of office and that was a great compliment from such a busy man. Responding, the Mayor wished them every success and hoped that they would carry on with their sporting section for the benefit of all concerned.

The dinner was followed by a concert, in the course of which a vote of thanks to the President was proposed by Mr. Lamb. Mr. Kent briefly responded.

A Progressive Concern

A study spread over several years, of the potentialities of what has come to be known as the mechanized foundry, convinced the Directorate of Messrs. R. A. Lister & Co., Ltd., of Dursley, Gloucestershire, that many of the advantages to be expected are neutralized unless the plant envisaged is adequately housed. Thus it was decided that an entirely new foundry should be built. The new building, which in a recent tour of the works we were privileged to inspect, is 360 ft. long by 170 ft. wide, 32 ft. high to the eaves, and has a cubic content of 2,760,000 cu.ft. It is pre-eminently suitable for the purpose it is designed to serve.

During the course of our inspection we were particularly impressed with the advanced methods of production, up-to-date office equipment, and the excellent schemes for the betterment of conditions for employees. In this latter connexion it is of interest to note that about half the population of Dursley and a large number of people living in the rural area within a ten-mile radius are employed by the firm. The health of the employees is cared for by the works clinic and maintained by the promotion of healthy exercise. We were greatly impressed by a display of physical culture given by twenty members of the gymnastic section; this reflected the highest possible credit on those responsible.

Among the multifarious manufactures of the firm, a speciality of interest to the Gas Industry is the auto-truck, which is made in a great variety of types. It is of interest to note that Lister passenger auto-trucks have been selected for use at the Glasgow Empire Exhibition, during the course of which, incidentally, the Lister Works Band is to play.

WESTERN JUNIOR GAS ASSOCIATION

THE PRESIDENT.

Mr. J. E. Akroyd was apprenticed to Messrs. Dempster & Sons, Ltd., of Elland, and later entered the firm's drawing office. He has supervised the erection of several complete installations of gas-works plant. In 1924 Mr. Akroyd was appointed Assistant Manager of the Great Western Railway Company's gas-works at Swindon, subsequently becoming Manager.

Presidential Address

OF

J. E. AKROYD, Assoc.M.I.Gas E.,

G.W.R. Gas-Works, Swindon.

[EXTRACT.]

Presented at the Meeting of the Association held at Swindon on April 23.

Previous to the present installation, 1921, the G.W.R. Works at Swindon were supplied by a battery of horizontal retorts with hand operated charging machine, the capacity of which was somewhere in the region of 1,500,000 cu.ft. of gas per day. The horizontal retort plant having become obsolete, and practically worked out, made it necessary either to have a complete overhaul, or for it to be replaced by an entirely new and modern installation. After much deliberation the latter alternative was chosen and a 3,000,000 cu.ft. Dempster-Toogood installation of continuous vertical retorts was put down in 1921.

The G.W.R. put down this 3,000,000 cu.ft. installation for industrial gas alone, and the whole of this gas and its complementary coke is used in many and various industries comprised in the 310-acre works of the G.W.R., which give employment to a personnel varying between 12,000 and 13,000.

Probably this complete gas-works is one of the world's finest examples of the industrial use of coal gas, and as it was built 17 years ago it is the more shining an example of the gas-mindedness of the powers that were of the G.W.R. some two decades ago.

Again, most gas engineers expect a big working load on Sundays. We have hardly any load on Sundays, the railway engineering workshops being closed. The ramifications of this reversal and normal practice are manifold, and a 2,500,000 cu.ft. spiral gasholder is the solution, for we steadily make into holder on Sunday, and also scheme to scurf our retorts on Sunday (another variant from normal practice).

To safeguard the gas supply, duplication of handling plant has been more perfectly developed in this G.W.R. installation than in any I know. In brief, it consists of two 1,500,000 cu.ft. installations built in parallel. Each of the two has its own space for extension at one end, and coal handling plant, coke grading and storage plant, and coke washing plant all in line, circumscribed by a gravity bucket conveyor, replete with transverse conveyor and helped by ball-bearing trucks, truckways, turntables, and electric hoists.

During the Great War, steel became scarce and very expensive, and ferro-concrete had not then made the necessary headway within gas-works, so that 4½ in. brick coke bunkers became an economic proposition. They resist the corrosive and erosive action of coke extremely well indeed.

The calorific value of the gas is interesting, for there are those who argue that the long distributing mains of a town rule out low grade gas economically. What then can they say here, where the mains are short, and yet our calorific value is maintained at 500 B.Th.U.?

The carbonizing plant and coke screening and washing plant are placed end to end in two separate buildings of steel framed structure, the walls being formed of 4½ in. brickwork filled in between steel columns and reinforced with tee bars built horizontally into the brickwork.

The retort house contains two benches of retorts, each bench consisting of six beds of four retorts each. The overall length of the benches is 94 ft., each being built to work independently of the other, the benches being supported on stanchions at a height of 13 ft. 6 in. above floor level to allow for the removal of coke and rendering the lower parts easily accessible.

Between the retort house and coke screening plant there are two electrically operated lifts and these are arranged to raise a load of coal or coke in trucks to the overhead hoppers at the rate of 2 tons, 100 ft. per minute.

A special feature in connexion with the removal of coke from the retorts is the extractor gear. In this, the extractor consists of an inclined tray made of cast iron, having removable steel plate liners on which the coke in the retort rests at its natural angle of repose, the tray being given a slow reciprocating motion by mechanism. The stroke of the tray is usually about 4 in. to 4½ in., but this can be adjusted independently for each retort by means of a crankpin. The time occupied by the tray in completing the cycle of its motion is about three minutes.

Special attention was given to the design of the coal and coke handling plant. The coal is delivered to the works in hopper bottom wagons, the average capacity of each being 12 tons, and running on standard gauge tracks both sides of the retort house. At one end of the building the track runs over the receiving hopper into which the coal is gravitated from the wagons. Under the hopper is an adjustable reciprocating tray from which the coal falls into a four roll breaker and forward to the elevator boot. The breaking machinery is driven by a 20 h.p. motor situated at the ground floor level, while the reciprocating tray is operated by chain drive and bevel gearing from the lower sprocket of the elevator, the latter being driven by 20 h.p. motor from the upper end. This method of driving ensures the transfer of the coal at a uniform rate irrespective of its size; also if the tray feeding coal to the breaker should stop from any cause the supply to the breaker would be automatically cut off, preventing a blockage in the machine. The coal handling arrangements are in duplicate on both sides of the retort house and capable of dealing with about 100 tons of coal per hour together.

The coke screening and washing plant is housed in a separate building adjoining the retort house, the building being of similar construction to the retort house. The partitions between the coke storage hoppers which extend for the whole length of the building are built of brick and form eight compartments. The floors of hoppers are of Jack Arch construction levelled off with concrete; the floor is about 15 ft. above the ground level. By means of chutes, coke can be delivered from any of the bunkers into railway wagons

running on standard gauge rail track along the centre of building; also to washing plant or producers as required.

The bulk of the coke from the retorts is carried round by the G.B. conveyors and delivered through chutes into the respective receiving hoppers. Each receiving hopper discharges on to a rubber and canvas belt conveyor which conveys the coke into a central receiving hopper fitted with a two-way chute with diverting doors arranged to feed the coke to either set of screens. The bottoms of the chutes are fitted with bar screens and the oversize being fed to a coke cutter and the throughs by-passing the cutters and feeding direct to the screen. The screens are in duplicate, of the rotary type, each set comprising one primary and one secondary screen.

There are five coke storage bunkers in all; the first two are used for large coke about 1¼ in., breeze in the third 0 in. to ⅜ in., and the fourth for small coke ⅜ in. to ¾ in., with a fifth for medium-sized coke ¾ in. to 1¼ in. The total storage capacity is 280 tons.

Each set of screens is driven by a 15 h.p. motor.

The coke from the screening plant is used in the railway works—small for rivet heating, medium-sized for smiths' fires, and large for general purposes.

A certain amount of the screened coke is passed on to the washing plant. There are four washers (two on each side of house) capable of dealing with 16 tons of coke per hour.

The total capacity of the washed coke and dirt bunkers is 100 tons, and the full storage capacity of the whole plant is 350 tons of coke.

Technical Work in a Holding Company

by
W. HODKINSON,
United Kingdom Gas Corporation, Ltd.

From a Paper given before the Manchester and District Junior Gas Association on April 9.

The prospectus of the Holding Company which I have the privilege to serve describes its aims and object in the following terms: "The policy of this Company shall be the co-ordination of sales organization and co-operation in technical and commercial organization. In areas suitable for the purpose, gas undertakings shall be grouped together, thus enabling them to render more efficient and economical service. Joint working between neighbouring undertakings will be established, while as far as possible individual local management will be maintained. Wherever technical conditions are favourable the physical link-up of works by pipe line for the supply of gas from one or more convenient manufacturing centres will be carried out. Supplies of coke oven gas will be purchased where available if terms and conditions are advantageous."

For the purpose of carrying out this policy the United Kingdom Gas Corporation has created a Central Administration Department, staffed and equipped to facilitate the control of its predetermined policy. In this Paper I propose to deal with the work of the Technical sections of this department during the past two years—that is, since the date of its inception. The constituent Companies of the Corporation consist of Undertakings with annual outputs ranging from 10 to 1,000 million cu.ft. per annum.

Method of Operation.

To enable the Central Department to arrive at a decision as to the technical assistance required, and for the purpose of maintaining records covering the activities of the Constituent Companies, a system of monthly returns covering technical results and work was instituted. These returns are extracted and set out in the form of a monthly statement of working results, which is submitted to the Board of the United Kingdom Gas Corporation and the chief Officials of the Constituent Companies for submission to their local Boards.

To the majority of the Undertakings the supply of this information merely entailed a duplication of the returns normally prepared for their own purpose, but in a number of cases, particularly on the smaller works, the information was of considerable value to themselves inasmuch as, in the extraction of the material from their books, they were compelled to observe information which in the past lay hidden in their books until the quarter, half-year, or even year's end—information which, if acted upon immediately, can result in considerable saving.

Since the inception of these returns we have been able to render considerable assistance to a great number of the smaller undertakings, who by virtue of their size cannot afford the advantages of skilled technical assistance. Such work as the control of carbonization, purification, &c.—routine work for the technical staff in a large undertaking—is very real service to the small undertaking.

A well-equipped laboratory in the central office is available for the testing of routine samples and the investigation of any technical problems which may arise; the volume of work which has passed through this department is shown in the following analysis of routine work carried out during the past 12 months, and I suggest that this is indicative of its value to the smaller undertakings who in the past have been compelled to carry on without such assistance.

TABLE 1.—*Analysis of Routine Laboratory Work Carried out for Constituent Companies.*

Type of Sample.	Number of Proximate Analyses or Tests.	Number of Complete Analyses or Tests.	Total.
Works materials—			
Coal	133	46	179
Coke	7	32	39
Tar	..	15	15
Benzole	2	10	12
Oxide	14	25	39
Deposits	..	21	21
Paints	..	106	106
Oils	..	148	148
Other works material ..	..	170	170
Distribution materials—			
Cookers	..	22	22
Fires	..	14	14
Service pipes	..	35	35
Meters	..	42	42
Other appliances ..	..	60	60
Deposits	..	15	15
Subsoils	1	3	4
Pipe protection materials	..	5	5
Totals	157	769	926

The monthly returns of working results are extracted by members of the Technical Staff, and Companies showing a falling off in results are offered assistance to enable them to investigate the cause of such a fall; test trials over a period of days will invariably result in a simple solution to the problem, and quite often a renewed interest on the part of the operatives on the plant is obtained.

Control of Materials.

The Central Administration Department has negotiated and obtained a considerable number of advantageous contracts for the supply of general materials and requirements. All such materials are subjected to test in the Central Laboratory, and contracts are placed subject to the results of these tests.

The Corporation has adopted the principle of long term hire purchase for appliances such as high-grade cookers and fires, such a system calls for the highest grade of appliance, and only appliances carefully designed and capable of main-

taining their efficiency over a long period of life can be considered. Having this important point in mind it was decided that for 10 years' hire-purchase periods, standardization of four or five grades of cookers should be attempted. Tests were conducted on a large number of cookers before the final selection was made. The results of these tests were particularly interesting, revealing a wide variation in efficiency on standard grades of cookers when tested under standard conditions. Similar investigations on the efficiency of meters with a view to standardization revealed the same wide variation, confirming the need for this control.

I could cite many cases where tests on both appliances and general materials has revealed this wide variation in quality and value. In the case of appliances we are fortunate in having manufacturers anxious to meet the demands of the Industry and more than willing to co-operate with us—the parent Industry—in an endeavour to supply our consumers with appliances capable of giving the maximum utilization efficiency of our product.

I am of the opinion that there is a need for more careful control in the selection of materials and requirements, a control which our smaller undertakings cannot hope to obtain without assistance.

Extension and Reconstruction of Works Plant.

Drawing offices have been installed in the Central Department for the purpose of providing assistance to constituent Companies in the preparation of schemes, estimates, and details for extension and reconstruction work.

The total capital cost of work which has passed, or is in process of passing, through this office, amounting to no less than £287,500, is indicative of the assistance rendered to the Companies. Several schemes of reconstruction and extension have been completed, and a number are at present in course of construction. The following work at present in progress on a Company situated on the North-East Coast is typical of our activities in this direction.

The table of working results which follows provides a picture of the Companies' size and general position.

TABLE 2.—*Statement of Particulars Relating to the Company.*

Gas made per annum, thousands	240,011
Gas sold per annum, thousands	218,464
Declared calorific value, B.Th.U. per cu.ft.	500
Coal carbonized, tons	12,314
Coke used (water gas plant), tons	1,387
Gas made per ton of coal and coke equivalent, cu.ft.	15,208
Coke available for sale per ton of coal, cwt.	7·0
Safe working output of plant per diem, cu.ft.	1,200,000
Maximum holder storage capacity, cu.ft.	540,000
Maximum day's send out, cu.ft.	965,000
Minimum day's send out, cu.ft.	452,000
Capital employed, £	81,555
Capital employed per million cu.ft. sold, £	374

The sales of gas on this Company are increasing by from 6 to 8% per annum; the Undertaking serves a popular Holiday resort and consequently has to face the problem of meeting the demands of a seasonal variation in population.

Immediately this Company was acquired it was realized that urgent attention to the question of available storage capacity was needed. The total capacity of 540,000 cu.ft. consisted of No. 1 Holder—capacity 180,000 cu.ft. 2-lift in brick tank erected by W. C. Holmes in 1881, the total pressure in the two lifts being 5·8 in. w.g. No. 2 Holder—capacity 360,000 cu.ft. 2-lift in brick tank erected by Clayton, Son, & Co., Ltd., in 1898, the outer lift was added in 1902, the total pressure in the two lifts being 5·8 in. w.g. No major repairs had been carried out on these holders since the date of erection. The total storage capacity represents 14 hours on "daily" storage, but on "hourly" storage only 9 hours. This apparently appalling condition was relieved to some extent by the available C.W.G. capacity amounting to 24 hours of the maximum day's output.

The need for additional storage was obviously urgent and schemes and specifications were drawn up for a three-lift spirally-guided holder having a capacity of 1 million cu.ft. and throwing a pressure of 12 in. w.g. in the three lifts.

The final design accepted for this holder was an electrically-welded construction, and as this is, I believe, the second largest all-welded holder in this country, a few construction details should prove of interest.

Welded Steel Gasholder.

The site comprises open land recently purchased adjoining the Gas-Works. Trial boreholes were made and revealed a moderately good and uniform bed of firm clay at a depth of 3 to 6 ft. below ground level.

The holder erected by Messrs. Ashmore, Benson, Pease, & Co., Ltd., conforms to the following specification:

Dimensions.	Diameter.	Depth.	Pressure Thrown.
	Ft. In.	Ft. In.	In.
Inner lift	116 3	31 9	6 w.g.
Middle lift	119 1½	31 9	9 w.g.
Outer lift	122 0	31 9	12 w.g.
Steel tank	124 6	32 8	

The general design of the gasholder conforms to normal modern standards, and incorporates all the usual refinements, such as Livesey seals, anti-freezing apparatus, &c. All the materials used are guaranteed of British manufacture, and the steel conforms to British Standard Specification No. 449, plates and sheets to be of copper bearing steel. Tests carried out on typical welded joints made in the shops under conditions, approximating as near as possible to those which would exist on site, confirmed the high efficiency claimed for such joints, and further investigations revealed the fact that considerable economies could be effected in design, particularly in the tank, without falling below the minimum factor of safety specified—namely, 4.

The following comparison of plate sizes designed for the tank to give a factor of safety of at least 4 on the ultimate strength of the materials is, I believe, extremely interesting.

TABLE 3.—*Tank 5 Tiers in Depth.*

Tier.	Riveted Construction.	Welded Construction.
Bottom tier	15/16 in. thick	11/16 in. thick
Second ,,	13/16 ,, ,,	9/16 ,, ,,
Third ,,	11/16 ,, ,,	15/32 ,, ,,
Fourth ,,	9/16 ,, ,,	7/16 ,, ,,
Fifth ,,	7/16 ,, ,,	5/16 ,, ,,
Top ,,	5/16 ,, ,,	5/16 ,, ,,

The following particulars of welding as applied to the tank sides are typical of the types of welded joints used in the construction:

Tier 1 bottom to curb	½ in. continuous fillet on the inside, 3/16 in. continuous fillet on the outside.
Tier 1 together	60° double V butt weld with double lacing straps a 6 in. pitch. Straps 5½ × 1¾ in., 3/16 in. continuous fillets on the sides of the straps and light sealing runs on the ends.
Tier 2 to Tier 1	⅜ in. continuous fillets on the outside 3/16 in. continuous fillet on the inside.
Tier 2 together	As for tier 1 together.
Tier 3 to Tier 2	5/16 in. continuous fillet on the outside, 10g/8 in. continuous fillet on the inside.
Tier 3 together	As for tier 1 together.
Tier 4 to Tier 3	Lap joint ¼ in. continuous fillet outside and 10g/8 in. on the inside.
Tier 4 together	60 butt weld with sealing run, with double lacing straps ¼ in. thick, 5½ × 1¾, ⅜ in. fillet weld on the sides of the straps and a light sealing run on the ends.
Tier 5 to Tier 4	Lap joint ¼ in. continuous fillet outside and a 10g/8 in. fillet on the inside.
Tier 5 together	As for tier 4 together.
Tier 6 to Tier 5	Lap joint ¼ in. continuous fillet outside and a 10g/8 in. fillet on the inside.
Tier 6 together	As for tier 4 and 5 together.

Two important factors should be noticed in the specification. (1) All butt welds are finished with a sealing run on the back of the joint. (2) Where continuous fillets are not required on the inside of a lap joint light sealing runs are used either continuously or between intermittent fillets.

The following tests which were carried out on single V butt welds with and without sealing runs on the back of the joint indicate the reason for this decision:

TABLE 4.—*Details of Tests Carried Out on Single V Butt Welds.*

Test Piece.	Breaking Load.	Ultimate Stress.	Remarks.
1. Without back run	18·7 tons	25 tons sq. in.	Broke at weld, 90° effi.
2. With back run	20·0 ,,	27 ,, ,,	Broke away from weld
4. ,, ,, ,,	20·8 ,,	27·7 ,, ,,	,, ,, ,, ,,

Light sealing runs on the back of lap welds are desirable, particularly on light gauge crown sheeting, if only to prevent

the lap opening out when men are walking on the crown. It is also desirable that moisture should not reach between the lap of the plates.

The design of all welds were specified to comply with the requirements of British Standard Specification No. 538-1934. The electrodes used in constructions were specified to comply with the requirements of the Board of Trade and the British Standard Specification No. 358, electrodes supplied by Messrs. Murex of the "Cresta" and "Ironex" type were used.

Sample specimens of electrodes and test specimens of joints prepared on the site under the same conditions as those obtaining on the gasholder construction have been taken from time to time, and these have invariably met the required standards.

Carbonizing Plant.

The existing coal carbonizing plant is inadequate and entirely out of date, having regard to the size and potentialities of the Undertaking.

The plant consists of:

One bench of seven beds each containing six 21 in. × 15 in. "D" section horizontal retorts, 10 ft. long, stop ends, simple regenerators, shallow 3 ft. deep producers.

One bench of four beds, each containing eight 21 in. × 15 in. "D" section horizontal retorts, 10 ft. long, stop ends, simple regenerators, shallow 3 ft. 6 in. deep producers.

One bench of six beds each containing six 20 in. × 15 in. "D" section horizontal retorts, 10 ft. long, stop ends, simple regenerators, shallow 3 ft. deep producers.

The charging of these beds is carried out by hand, coal is received on the works sidings in bottom hopper wagons, the sidings are elevated above ground level over a series of storage bays adjoining the retort house, and coal is wheeled into the house in barrows from the coal storage bays. The coke is wheeled out of the retort house in barrows, quenched under a spray, and dumped into the yard. The Company has an extremely good market for graded coke for domestic use, a demand far in excess of the available output.

No. 1 bench of retorts was in an extremely bad state of repair at the time of acquisition and it was realized that this question would require attention at an early date.

It is obvious without going into details of costs that manufacturing charges by the above method of production for a works having an annual output of 240 million cu.ft. per annum and a maximum day's output of practically 1 million cu.ft. is extremely high.

The following table shows the manufacturing costs and net cost into holder at these works:

TABLE 5.—*Net Cost of Manufacture in Pence per 1,000 Cu.Ft. and per Therm of Gas Made.*

	Pence per 1,000 Cu.Ft.	Pence per Therm.
Coal and oil (including charges)	15·01	3·00
Less receipts from residuals	7·41	1·48
Net cost of coal	7·60	1·52
Purification	0·34	0·06
Salaries and Wages	3·79	0·76
Repairs and Maintenance works and Plant	5·68	1·14
Net cost of gas into holder	17·41	3·48

Comparison of these figures with the costs given later in the Paper for a works having an output of 123 million cu.ft. per annum shows that the smaller works equipped with modern plant can put the gas into holder 0·53d. per therm cheaper than this particular works.

It was decided that a complete new carbonizing plant capable of meeting the full load of the undertaking should be erected, and schemes were drawn up for a plant having a capacity of 1¼ million cu.ft. of gas per diem.

Vertical retorts, horizontal retorts, and vertical chamber ovens were considered, and after having regard to capital cost, operating charges, type of coke produced, and the guarantees for gas and coke produced and available for sale, it was decided that vertical chamber ovens were most suited to this Company's requirements.

The plant at present in course of construction consists of 12 C.O.L. intermittent vertical chamber ovens arranged in one bench and divided into four settings each of three chambers, with separate recuperators and producers, together with coal handling plant, and coke quenching, screening, and storage plant.

The scheme lends itself admirably to the site available, full use of the existing sidings arrangement has been obtained, and the existing retort houses will provide adequate covered coal storage for the plants requirements. Estimates of operating costs, based on conservative yields, indicate a saving over existing costs of at least 4d. per 1,000 cu.ft. of gas sold.

Grouping by Physical Link-up.

The Corporation has acquired undertakings in well-defined geographical groups in accordance with the main object of their policy, and in a number of cases link-up by pipe line will be possible. Three schemes have been completed and a number of schemes are in course of preparation in the drawing office. A typical example of such a link-up is part of the recently completed scheme of amalgamation between the Runcorn and Frodsham Gas Companies. The two areas of supply are in close proximity to each other, and the Amalgamating Order provides for the absorption of the Frodsham area into that of the Runcorn Company.

The following tables provide a picture of the position existing, the two Companies operating as separate units. Table 6 gives a statement of general particulars relating to the Companies. Table 7 gives the relative costs of manufacture in pence per 1,000 cu.ft. and per therm of gas made at the two works:

TABLE 6.—*Particulars Relating to the Two Companies.*

	Runcorn.	Frodsham.
Gas made. 1,000 cu.ft.	123,766	33,587
Gas sold. " " "	109,394	28,719
Coal carbonized, tons	8,868	2,433
Coke sold, tons	4,026	960
Gas made per ton of coal, cu.ft.	13,956	13,804
" " " " " " therms	69·78	69·02
Coke sold " " " " cwts.	9·08	7·89
Declared calorific value	500	500
Maximum day's output, cu.ft.	476,200	139,000
Minimum day's output, cu.ft.	226,800	57,000
Safe working capacity of plant, cu.ft. per diem. ..	800,000	150,000
Total number of consumers	6,130	1,791
Gas sold to domestic consumers. 1,000 cu.ft. ..	82,310	23,241
Gas sold to industrial consumers. " " " ..	15,960	2,037
Capital employed, £	71,105	19,875
Capital per million cu.ft. of gas sold, £	575	591

TABLE 7.—*Analysis of Cost of Manufacture, Maintenance, and Net Cost into Holder. Pence per 1,000 Cu.Ft. and per Therm of Gas Made.*

	Runcorn.		Frodsham.	
	Pence per 1,000 Cu.Ft.	Pence per Therm.	Pence per 1,000 Cu.Ft.	Pence per Therm.
Coal (including handling)	15·82	3·16	16·80	3·36
Less residuals	9·07	1·81	9·65	1·93
Net cost of coal	6·75	1·35	7·15	1·43
Purification	0·15	0·03	0·21	0·04
Wages and salaries at works	5·57	1·11	6·25	1·25
Repairs and maintenance works and plant ..	2·26	0·45	5·02	1·00
Materials	0·04	0·01	0·09	0·02
Net cost of gas into holder	14·77	2·95	18·72	3·74

A careful survey was made of the possible routes for a pipe line between the two Companies' works, and after having regard to the cost of wayleaves, reinstatement charges, &c. A route across country and in grass verge along a main arterial road was eventually chosen. This involved a pipe length of 7,550 yds.

The economical size of pipe in relation to cost of compression and required output was calculated according to the formula contained in the Paper given by Mr. Stephen Lacey to The Institution of Gas Engineers on "Economic Aspects of High-Pressure Gas Distribution."

This method of arriving at an economical basis for the pressures to be used in a system, and the corresponding

economical size of main required for a definite load is invaluable, but it is also important that due regard should be paid to the load which the main may have to meet in 20 to 30 years' time. With this point in view careful attention should be paid to prospective development whenever a main of this type is contemplated; for instance, an ideal route from the economical point of view may take the main far away from sites, which in 15 or 20 years' time might be the centre of industrial or building development activities.

The link-up was made by means of a 6 in. diameter steel main, acetylene welded joints being used. The whole of this work was carried out by contractors, all bends, specials, &c., were made on the site, with the exception of specials required for two bridge crossings spanning the Weaver Canal and River Weaver.

Rotary compressors having a capacity of 20,000 cu.ft. per hour against a pressure of 20 lb. sq.in. were installed at the Runcorn works, and the main feeds direct into the holders at the Frodsham works. Adequate holder storage capacity was available at Frodsham, and it is proposed to boost into these during off-peak periods at Runcorn.

Return of the Scheme.

The savings effected by this scheme are shown in the following estimates:

		Cu.Ft. per Annum.	£ s. d.
Gas required—Runcorn		123,766,000	
Frodsham		33,587,000	
Total		157,353,000	
Add Loss on transmission to Frodsham (3%)		1,007,000	
Total requirements		158,360,000	
	Cost of Manufacturing all Gas at Runcorn.		
Debit.	Coal, 11,347 tons at 18s. 6d. per ton (including expenses)	£ 10,495 19 6	
	Purification at 0·19d. per 1,000 cu.ft.	125 7 4	
	Wages and salaries at works	2,872 8 0	
	2 additional men (4 months p.a.)	130 0 0	
	Repairs and maintenance of works and plant at 3·0d. per 1,000 cu.ft.	1,979 10 0	
			15,603 4 10
Credit.	Coke—9·08 cwts. per ton of coal carbonized at 18s. 9d. per ton net (5,152 tons)	£4,830 0 0	
	Tar—10·90 galls. per ton of coal carbonized at 35s. 10d. per ton net (618 tons)	£1,107 5 0	£5,937 5 0
	Net cost into holdr at Runcorn		£9,665 19 10
Add	Cost of transmission to Frodsham, compressing 34,594,000 cu.ft. at 0·5d. per 1,000 cu.ft.	72 1 5	
	Wayleaves, &c. (annual charges)	75 0 0	
			147 1 5
			£9,813 1 3
	Cost when manufacturing at two works.		
Runcorn, 123,766,000 cu.ft. at 14·77d. per 1,000 cu.ft.		7,616 15 4	
Frodsham, 33,587,000 cu.ft. at 18·72d. per 1,000 cu.ft.		2,619 15 9	
			10,236 11 1
Net saving per annum			£423 9 10

Return on the Capital Expenditure on mains, compressors, &c. (£4,600) = 9·21%.
Gross saving per 1,000 cu.ft. of gas sold in Frodsham is 3·54d.

Prior to acquisition by the United Kingdom Gas Corporation these two Companies had worked in close co-operation under the management of Mr. G. S. Frith, J.P., and the question of link-up had received his consideration for some considerable time. Acquisition by the Corporation smoothed away several difficulties and it was possible to proceed with the amalgamation and link-up of the Undertakings immediately.

Bulk Supplies.

We have several schemes in hand for the purchase of bulk supplies of coke oven gas for distribution to groups of companies on the Grid System principle. Where such supplies are available at reasonable prices considerable savings can be effected over groups of undertakings.

This problem is of sufficient interest to warrant a Paper devoted entirely to the subject; therefore, I do not propose to deal with the matter in any detail.

Consolidation within Groups.

Consolidation of effort within groups of companies, as distinct from grouping by physical link-up, offers considerable scope for improved working; indeed, in quite a number of cases physical link-up is an economical impossibility.

The following table of statistics relating to certain gas undertakings is of interest in this connexion, showing as it does the variation in manufacturing costs as between large and medium-sized undertakings:

TABLE 8.—*Table of Statistics relating to certain Gas Undertakings.*

Company.	Therms Sold, Thousand.	Total Capital Employed per 1,000 Therms Sold.	Net Cost of Gas into Holder pence per Therm Sold.
A	571	118	3·61
B	865	137	4·10
C	1,558	140	3·93
D	1,850	137	3·49
E	20,179	116	2·63
F	34,571	97	4·04
G	80,136	144	3·39
H	259,562	104	2·94

The following table relating to costs of manufacture in the competitive industry is of interest:

TABLE 9.—*Table of Statistics relating to Electricity Authorities.*

Total number of Units Sold (Million kWh).	Number of Undertakings included.	Total Operating Costs, Pence per Unit Sold.
0–1	208	1·18
1–5	162	0·74
5–10	61	0·56
10–25	70	0·45
25–50	54	0·38
50 and over	42	0·28

There are many factors to be considered before link-up by pipe line between adjacent companies can be effected, and these are such points as: (1) Size of the Undertakings. (2) Distance apart. (3) Will the linking main pass through an area where additional consumption could be obtained? (4) Nature of the route between the works, wayleaves, &c. (5) Expenditure which might be required to increase the capacity of existing plant at one of the works to enable it to deal with the total load and leave a satisfactory margin for future development.

We have found in a number of cases that the difference in manufacturing costs between quite small undertakings and medium-sized undertakings does not always warrant the link-up of companies by pipe line, particularly where cheap supplies of coke oven gas are not available and over long distances through rural areas.

Consolidation can, however, be effected by group working. Where a number of small companies are situated within convenient distance of a larger undertaking, close collaboration can be maintained, and in effect the strength of the larger company is brought to the assistance of the smaller undertakings within the group area.

In this way the chief official of the smaller company can obtain the refinements of modern practice normally far beyond the limits of his pocket. Many advantages can be obtained, such as the services of sales specialists, advertising and publicity experts, home service organizations, &c. The use of accounting machinery, continuous billing by the formation of a central billing scheme, and many other services can be obtained.

This subject is somewhat outside the scope of this Paper. I would, however, suggest that there is a sound case for the co-ordination of gas undertakings in organized groups. The scope of our Industry to-day calls for the increasing employment of specialists in sales and utilization. Technical sales service has become increasingly important, and one of the major problems of to-day is that of providing service to the consumer.

The small undertaking working on its own cannot afford the service of the expensive specialist, and the manager is usually far too occupied with the daily routine to study and keep abreast of modern development. In providing the answer to this problem I suggest that Holding Companies are performing a useful and valuable service to the Gas Industry.

Public Lighting.

The recently published Final Report of the Ministry of Transport Committee's recommendations for Public Lighting has considerably increased the demand by local authorities

for more efficient lighting in the areas under their jurisdiction.

Many roads have been taken over by the Ministry for purposes of lighting, and these will be illuminated to the standards prescribed in the Report. Authorities who desire to take advantage of the recent offer made by the Ministry, giving financial assistance for the purpose of improving Public Lighting on main traffic routes, will most probably find that this assistance is only available providing the lighting is carried out in accordance with the recommendations contained in the Report.

A large proportion of the main and by-road lighting in this country falls a good deal short of the prescribed standard and from our experience it is obvious that many Local Authorities are anxious to remedy this position. This means that many of us are going to find ourselves face to face with a renewed competition for this business, and indeed many of us have lost considerable Public Lighting loads during the past two years.

I am amazed at the defeatist attitude adopted to this problem by a large section of our Industry. This I am satisfied is entirely wrong, given a fair hearing and an opportunity to demonstrate our modern equipment, we can still maintain and increase our load in this field.

During the past year we have undertaken a large number of schemes on behalf of our constituent companies, and I am pleased to say that in the majority of cases we have been successful in securing the business. In three of these schemes a change-over from electricity to gas was in question, and in two cases we were successful and contracts for a period of 10 years were secured. It is interesting to note that in one of these cases electricity had held the field for the past 20 years.

In the majority of cases we have found that the local Authority have formed the opinion that, for public lighting, gas is out-of-date. Quite recently we arranged for the surveyor to a certain public authority to inspect an installation of Class A lighting. He was astonished to find that this was done by gas, and admitted that he had travelled along this road on many occasions and, noting the effectiveness of the lighting, had subconsciously decided that it was electric.

The design of modern public lighting installations calls for rather more technical skill than has been required in the past, and in this connexion I would call attention to the valuable co-operation which the lighting equipment manufacturers are only too pleased to place at our disposal.

A recent installation which we have completed on behalf of one of our constituent companies covers a total main traffic road length of 3½ miles—in fact, all the main traffic routes in this particular Authority's area. The lighting is carried out by 12-light low-pressure units, Suggs "London" type, staggered at 44 yd. intervals with a mounting height of 23 ft. The lamps have a total lumen output of 5,100, or 3,803 lumens per 100 ft. of road, with a carriageway 30 ft. wide.

A demonstration of 20 lamps was erected by the Company without cost to the Authorities, and as a result of this demonstration we received an order for 108 additional lamps; this has since been increased to 145 lamps. One unusual feature of this order was the fact that the Company bears the capital cost of the installation, the charge for the work covering capital cost, lighting, maintenance, and gas. In the case of small local authorities we have found this method of charge particularly effective, and, of course, such a charge necessitates the authority entering into a contract with the Gas Company for a period of years.

I am of the opinion that we must be prepared to make sacrifices in an endeavour to retain this lighting load. Effective road lighting can be a valuable form of publicity. On the other hand, poor lighting is a definite menace to our endeavours to obtain a gas-minded public, indeed I would go so far as to say we would be better off without such lighting.

We are making determined efforts to persuade Local Authorities to improve their lighting, and the method of charges previously mentioned is particularly useful in this connexion. We have found that even small rural authorities are anxious to improve their lighting, but the obstacle is capital. Quite recently we obtained a 10-year contract for the lighting of a small village previously without light, the complete job consisted of only 22-3 light units, but the local interest created has resulted in a larger neighbouring community, rather poorly lit by electricity, to approach us for a scheme for the lighting of a housing estate at present in course of erection.

Discussion.

Mr. J. ALBINSON (President) said he could understand that the technical work of a holding company had a very wide scope, even wider possibly than the technical work in a large undertaking. With regard to the Runcorn-Frodsham amalgamation, he would like to ask Mr. Hodkinson if the gross saving of 3·54d. per 1,000 cu.ft. had been passed on to the Frodsham consumers.

Mr. A. E. SIMPSON (Macclesfield) referred to the section of the Paper dealing with the control of materials, which stated that advantageous contracts had been placed for meters and appliances. If a contract was placed with one firm for the whole of the requirements of a holding company it might be necessary for the contractor to put down additional plant, but at the end of the contract some other contractor might be favoured. In such circumstances it was very difficult to see how holding companies would assist the Gas Industry in this respect. In the Runcorn-Frodsham amalgamation, Mr. Hodkinson apparently assumed that there would be no necessity to increase capital so as to provide additional plant. Was there any possibility in the future of the sales increasing to such an extent that additional plant must be put down at Runcorn? If so, then the saving of 3·54d. per 1,000 cu.ft. shown in the Paper must be reduced.

Mr. HODKINSON said the price of gas had not yet been reduced in Frodsham, but one main advantage from the link-up was that industrial gas could be supplied in Frodsham on advantageous terms. In reply to Mr. Simpson, it was stated in the Paper that they were endeavouring to find 4 or 5 manufacturers to supply a standard cooker. The hire purchase terms were ten years, and to conform to good practice the cookers had got to stand up to that life. The Gas Industry did not do the amount of work it should on standardization, more especially on appliances. In the smaller undertaking it was the usual practice to order each month one of this design and one of the other, not because the consumer ordered them. If standardization were adopted, and 30,000 cookers could be ordered every four to five months, then money was going to be saved. With regard to the Runcorn-Frodsham amalgamation and the question of additional capital, there was a proposal to erect a modern works centrally between Frodsham and Runcorn, but this aspect had not been dealt with in the Paper.

Mr. E. ALLEN (Droylsden) said that no details of the staff employed at the Central Laboratory had been given, but a considerable amount of work had been done. He would like to know if the figure of 106 tests referred to complete chemical analyses of paints, or did it include exposure tests. He was of the opinion that the chemical analyses had a limited value, and that exposure tests were necessary. While on the subject of analyses, it would have been useful to have the analysis of the copper-bearing steel used in the construction of the gasholder. It was known that copper reduced the ordinary welding power of steel, especially if sulphur was present to any large extent.

Mr. HODKINSON stated that the paint tests consisted of exposure tests and pigment proportions. There was an apparatus for making accelerated exposure tests, but large-scale exposure tests were to be preferred. He could not give particulars of the copper-bearing steel, but the data could be given later.

Mr. H. C. APPLEBEE (Manchester) recalled that some years ago a suggestion was made that it would be of immense value if a central laboratory was established for the benefit of the smaller undertakings. At the present time the holding companies were providing such a service for its constituent companies.

Mr. ELLIOTT (Stockport) enquired if the co-ordination as outlined in the Paper had produced any results. Had the consumers in the various areas of the holding companies reaped any benefit up to the present time, or were they expected to benefit in the future?

Mr. HODKINSON replied that the main object of holding companies was particularly the provision of central administration to consolidate the holding and to maintain and increase the output of their constituent companies. Assistance was given to provide cheaper gas and also to sell in competition with a competitor which was bringing its own costs down by leaps and bounds.

Mr. T. SMITH (Rochdale) asked if the price of gas to consumers in each individual area of a holding company would be based on the costs of production in that area, or will it be dependent upon the prosperity of the holding company. With regard to the selling of gas and appliances they were up against difficulties in the smaller towns, particularly in regard to prices, which indicated the necessity for some form of regional control. Holding com-

panies were adopting the useful function of unifying appliances. Were they going to unify prices?

Mr. HODKINSON stated that it would be very difficult to consider the unifying of the price of gas throughout the area supplied by the United Kingdom Gas Corporation. Conditions varied so considerably in the respective areas throughout the country. It was very nice to have a wide range of appliances, but to provide that range was very costly.

Mr. A. HASLAM (Bolton) noted the remark in the Paper that it was necessary to make sacrifices in an endeavour to retain the public street lighting load. In Bolton it was necessary to make a very big sacrifice to bring down the cost of an installation of "London" lamps to that of sodium, and the question arose as to whether an installation was an advertisement for gas users. Did the ordinary domestic consumer really care whether the roads were lit by gas or electricity?

Mr. HODKINSON stated that sacrifices were necessary to maintain the street lighting load. Gas must be kept before the public, and it was essential that undertakings should reduce prices in order to retain the load. Undertakings would go down to 4d. or 6d. a therm to obtain an industrial load, but it was quite common to hear of undertakings obtaining 11d. a therm for the street lighting load, which probably represented 5 or 6% of the total output. Rather than reduce the prices to 5d. a therm, some undertakings would prefer to lose the load. While the surveyor referred to in the Paper was unaware of the fact that the new street lighting system was gas, every opportunity was taken to inform the residents of that fact. The authority in question was contemplating sodium lighting on the main road, which would have been followed by similar lighting on side roads. With a reduction in price to 5d. per therm the lighting load was consolidated. Valuable publicity was obtained by having their streets lighted by gas.

Mr. W. T. HAINSWORTH (Wallasey) enquired if the electrically welded holder had been accepted by the Insurance Company under the terms of the new Factories Act.

Mr. HODKINSON stated that the United Kingdom Gas Corporation had a comprehensive insurance policy, and the welded holder had been accepted.

Mr. H. BROMLEY (Bolton) was of the opinion that it was good practice to supply gas cookers capable of rendering service for 10 years. There were two classes of consumer, the wealthy and the poor, and in designing and standardizing cookers it was essential that both should be kept in mind.

Mr. HODKINSON agreed, but pointed out that it was essential that the poorer consumer should have modern appliances fitted with thermostatic control.

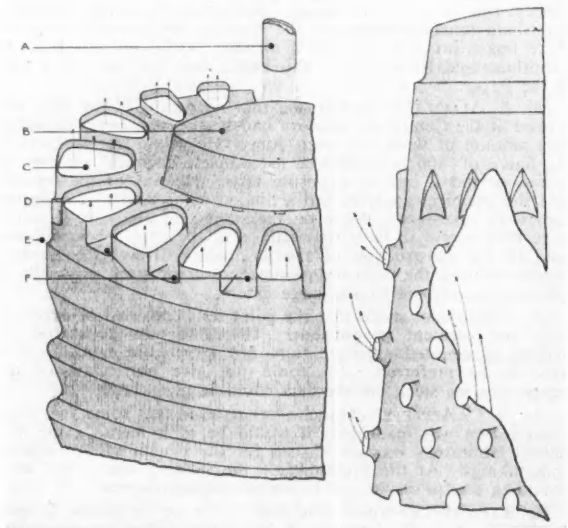
Mr. A. K. COLLINGE (Preston) proposed a vote of thanks to the Author.

Mr. J. GRAHAM (Lancaster), in seconding, said that co-operation with the larger undertakings was bound to be of benefit to the small undertakings. There was a definite case for co-operation or amalgamation.

The "National" Bath Water Heater

Operating Principles Explained

In the "JOURNAL" for March 16 we gave a brief description of an interesting bath water heater which has been placed on the market by the National Gas Water Heater Company, Ltd.—an appliance which should be of much help in extending the water heating load.



Outer Cone. Inner Cone.

A. Cold water flow pipe.
B. Top of inner cone.
C. Outlet for gas products (note raised walls).
D. Small water orifice to inner cone.
E. Water flowing over corrugated cylinder.
F. Water channels to outside of cylinder.

In that description we explained that the new appliance (the "National") is a single point heater of neat design finished in white enamel with chromium plated fittings. The connexions, both gas and water, are inconspicuously tucked away, and the standard model is equipped with a volume gas governor, a safety pilot, and an automatic water valve. The gas consumption is 180 cu.ft. of 500 B.Th.U. gas per hour and the flow is 3 gallons per minute.

The construction of the appliance, which is designed for low cost of production and low maintenance cost, is commendably simple. Maintenance costs—and this we regard as most important—are likely to be at a minimum with this new heater, which is equally suitable for hard and soft water. An effective baffler is an integral part of the appliance. As for dismantling, this is simplicity itself. There are no nuts or screws. It is only necessary to lift the enamelled body off the burner, and remove the two aluminium heat exchangers.

In the ingenious design special care has been taken to ensure that the products of combustion are led away, as far as is compatible with adequate heat transfer and minimum scale, from the water stream, and an examination of the diagrammatic sketches of the construction of the aluminium heat exchangers will show how successfully this has been achieved. The sketch on the left of the diagram is of the outer cone, while on the right is a section of the inner cone. Water flows from A on to the top of the inner cone and is conducted through water channels F to the outside of the outer cylinder and down the sides, which are solid. It will be particularly noted that the products of combustion are led away through outlets C which have raised walls which separate the products and the water. Small orifices D on the outer cylinder allow a small quantity of water to pass down the sides of the inner cone. Here again it will be noted from the design of the inner cone that raised projections direct the products of combustion away from the water on to the inner surface of the outer cylinder.

It will be appreciated, therefore, that this new appliance is in quite a different category from the old-type open geyser, and there need be no fear whatever of contamination of the water. Objection to the old type was due to the use of copper and to faulty combustion design. The new heater described here does not employ copper; and as for combustion design, this conforms to the standards of the B.S.I. Specification for combustion testing of gas appliances involving entirely satisfactory combustion at 100% pressure overload. It will be appreciated, too, that with the heater described the water is hot immediately it flows from the spout and that no water has to be stored in the appliance when it is not in operation.

Coke Fires in the House of Commons

We understand that the Rt. Hon. Sir Philip Sassoon, H.M. First Commissioner of Works, has given instructions for coke fires (not assisted by gas ignition or special grates) to be fitted in certain rooms used by members of the House of Commons. The first fire was started on Monday morning in the presence of Sir Philip, who expressed his satisfaction at its performance.

Mr. E. W. L. Nicol, of the London and Counties Coke Association, who has done so much in encouraging the use of coke fires for domestic purposes, was present. The smoke abatement aspect has been an important factor in influencing this decision by the Commissioner.

United Kingdom Gas Corporation

Further Acquisitions and Increased Sales

The Third Ordinary General Meeting of the United Kingdom Gas Corporation, Ltd., was held on April 25 at the Institute of Chartered Accountants, Moorgate Place, London, E.C. Mr. R. B. H. OTTLEY (Chairman of the Company) presided.

The REPRESENTATIVE of the SECRETARIES (Messrs. Close Brothers Limited) having read the notice convening the meeting and the report of the auditors,

The CHAIRMAN said: Gentlemen,—I feel perhaps that a word of apology is due from me to the shareholders in that, by reason of my recent illness, they have been kept waiting for some few days for this meeting. From my own point of view, however, this has not been wholly disadvantageous because, in my enforced isolation, I have had the opportunity of reviewing in my own mind the operations of our Company in perhaps a more detached manner than is possible in the hurly-burly of the City and obtaining, as I dare hope, a true perspective of our aims and achievements.

Growth of the Corporation.

The accounts which have been in your hands for some days will, I think, enable you to judge the growth of the Corporation during the past year, and very little in the way of comment from me will be necessary. The revenue account reflects an all-round increase in revenue as a result of the acquisition of additional undertakings. During the year £10,913 has been received by way of Directors' fees, which we regard as a return on the amounts paid out by way of compensation to outgoing Directors of subsidiary companies. From the commencement of your Corporation to the date of the balance-sheet the total thus paid out amounts to £111,409, so that the return is very satisfactory. In the balance-sheet details of the cost of investments show that the cost of acquisitions during the year amounted to £1,099,614, as compared with £1,741,986 in 1936. This apparent falling-off is to some extent accounted for by the fact that some of the successful negotiations were in respect of municipally owned gas undertakings, requiring statutory powers or Board of Trade Order for completion, and these undertakings are being absorbed by existing subsidiary companies. Loans to subsidiary companies have increased to £123,083. The bulk of this is of a temporary nature, and in fact £50,312 has since been repaid.

The expenses of increase of capital, &c., reflect the increase in both the authorized and issued capital of your Corporation. When an increase of the authorized capital was found to be necessary early in 1937 it was decided to anticipate the requirements of more than the succeeding 12 months in order to avoid duplication of expense. As a result, although issued share capital has grown to £3,265,693, there is still nearly £3,000,000 of authorized capital available for issue.

Allocation of Profit.

The balance of revenue account is arrived at after providing for the dividend on the 4½% Second Non-Cumulative Preference shares. The balance of revenue for the year amounts to £110,188, to which must be added the balance brought forward from last year, £9,773, making a grand total of £119,961.

Dividends on the three types of Preference shares at the full rates, together with an interim dividend of 2% on the Ordinary shares, absorb £74,827, leaving a balance of £45,134. Of this balance your Directors have applied £10,000 to writing down expenses of increase of capital, &c., and it is proposed to pay a final dividend of 3%, less income-tax, on the Ordinary shares for the year ended Dec. 31, 1937. This will require £21,908, leaving a balance of £13,226 to be carried forward to next year.

I would remind you that this is only the end of the second complete year of the Corporation's existence, and during this time we have grown from our initial paid-up capital structure of £125,000 to a paid-up share and loan capital of around 4½ million pounds. A structure so large, and one that we have every intention of making still larger, requires strong foundations, and this has been a period of foundation building, an expensive but absolutely necessary process.

Sources of Success.

Our success is, and will always be, conditioned upon the satisfaction we are able to give to our consumers. I am convinced that satisfactory service to the consumer must be the very first consideration in a business such as ours, and this implies efficiency of manufacture and distribution. Of equal importance are fair conditions of employment for our personnel, and in this connexion it should be noted that wherever we are seeking new statutory powers we make provision for co-partnership schemes. If we are able successfully to tackle these two problems, I am quite convinced that our shareholders will automatically come into their own.

These being my premises, let me try to trace how far we have proceeded along the path of progress. It would appear that to some extent we have been able to give satisfaction to our consumers as the total sales of gas show an increase of 3·92%, which compares very favourably, I think, with the results shown by all the other gas holding companies. We may, I venture to say, look upon these sales as a satisfactory beginning. But you have to prepare the grounds carefully for increasing gas sales, particularly on the domestic side; gas has been in use for generations —for over 120 years—and the consumer takes it for granted and requires a special stimulus before he can be induced to interest himself in new developments, and particularly must he be satisfied with existing service.

We have inaugurated this year special campaigns for the selling of apparatus organized by highly trained expert salesmen controlled by our central administration, in collaboration with and under the guidance of our managers. We are dividing our companies into groups, and it will interest shareholders to know that in the first group we have been able to tackle we have in two months managed to quadruple the turnover in sales of gas appliances, a good augury for the future. Moreover, a large part of these sales constitute new loads in the homes of existing consumers. These remarkable results, I venture to assert, could not have been achieved save under what is known as the Holding Company System. The individual undertakings which were grouped together for the purpose of this campaign could not have provided the personnel, publicity, and organization necessary for their attainment.

I quote these results thus early in my speech to indicate to you what can be obtained by planning and combining sales effort to serve a group of companies. While much can be done in co-ordinating effort by provision of centralized services, technical, sales and administrative, even more can be accomplished by physical amalgamation wherever geographical considerations will permit. This has been one of the main objectives we have had before us during the past year, and I will venture to give in detail those that have been effected and those which are in course of being brought into effect.

Amalgamations Completed and Planned.

The procedure has been, in the main, by provisional order of the Board of Trade. In one case, however, an Act of Parliament has been promoted and has passed the House of Commons for the confirmation of the purchase of the publicly owned undertaking of the Radcliffe and Little Lever Joint Gas Board, and its amalgamation with the Farnworth and Kearsley Gas Company.

The following amalgamations have been, or will be, made under the provision of Board of Trade Orders:

(1) Ormskirk District Gas Company—Croston Rural District Council Gas Undertaking.
(2) Runcorn Gas Company—Frodsham Gas Company.
(3) Hyde Gas Company and the Gas Undertakings purchased by agreement of the Dukinfield Corporation and the Denton Urban District Council.

In addition, the amalgamation of the Farnworth and Kearsley Gas Company with the Radcliffe and Little Lever Joint Gas Board is to be confirmed by Act of Parliament, the undertaking being taken over as from April 1, 1938.

Orders are in course of preparation for the amalgamation of:

(1) A group of seven companies in Yorkshire—viz., Castleford, Normanton, Featherstone, Rothwell, Knottingley, Kippax, and South Milford.
(2) Ormskirk and Leyland Gas Companies in Lancashire.
(3) To confirm the purchase of the Morley Corporation Gas Undertaking, and its amalgamation with the Drighlington and Gildersome Gas Company and the East Ardsley Gas Company.
(4) Amalgamation of Bridlington and Hornsea in East Yorks.
(5) Llanelly and Gowerton Gas Companies in South Wales.

Non-Recurring Expenditure.

All these amalgamations have to be subjected to departmental or Parliamentary enquiry which is normally cumbersome and slow, and entails an immense amount of work and expense, but it is expense of a non-recurring nature and forms part of those costly and substantial foundations to our business to which I referred earlier in my speech. It is an expenditure not immediately remunerative but of which we may hope to enjoy the fruits in the years to come. Another heavy item of expenditure is involved in bringing up to date the various works that we take over from time to time. Whilst a careful physical inspection is made before we ever purchase a company, we find in practice

that in many instances we have to do a great deal of work to improve the working of our undertakings and render the best service to our consumers by the efficient distribution of gas of constant quality, gravity, and purity; the whole of the designing and specifying of such work is done in the drawing offices of the Corporation on behalf of the companies.

Details of Contracts.

I would recite the following contracts as indicating some of the work undertaken by central administration—

MANUFACTURING PLANT.

Installation of chamber ovens in complete replacement of existing obsolete carbonizing and subsidiary plant at Bridlington.
Reconstruction of carbonizing water gas and other plant at Hyde and Llanelly.
New gasholders for:
Bridlington,
Harrogate (Thorner),
Muirkirk (Caledonian),
Ramsbottom,
Garforth,
Aylesbury, and
Malton.
Numerous other extensions and reconstructions have been carried out for other companies including benzole plants at Ramsbottom, Runcorn, Prescot, and Whitby, coke plants at Runcorn and Whitby, &c.

DISTRIBUTION WORKS.

We have prepared mains extension schemes or assisted in their preparation at Harrogate, Runcorn, Malton, Leyland, Pudsey, Castleford, and Hyde, and have many others in hand.
In addition, assistance has been given to Caledonian Gas Corporation in connexion with mains extensions and the linking up of undertakings.

Street Lighting.

Work has been done for a number of companies to enable them to quote for new business, or the renewal of existing business, with successful outcome in the majority of cases, including Denton, Dukinfield, Normanton, Garforth, and Sherburn, also assistance has been given to Harrogate, Hornsea, and others in the preparation of schemes.

New showrooms have been erected or are in course of erection at Llanelly, Dukinfield (for Hyde), Ramsbottom, Quakers Yard, Leyland, and Ormskirk.

The above is additional to the vast amount of work undertaken in connexion with proposed West Yorkshire Gas Distribution System and the construction of new coke ovens at Hemsworth, which latter work we have undertaken conjointly with the colliery company.

Assistance to Constituent Companies.

In addition to constructional and technical work, our central administration has continued to render assistance to our constituent companies in many ways, such as sales planning, preparation of publicity and advertising material, the organizing of exhibitions, cookery demonstrations, and cinema shows, for which purpose we have acquired the most up-to-date equipment and skilled operators, the provision of home service demonstrations, &c., the co-ordination and centralization of accounting, and the installation of mechanical billing, &c.

The cost of the provision of these services is of necessity large and, while it must be admitted that sales and publicity services must be maintained at a much higher standard than in the past, such expenditure should be self-supporting. I must include a portion of the central administration expenditure in the same category of non-recurrent expenditure that I lately compared to expenditure upon foundations; at the same time we do not propose to cut down any expenditure directed to improving general efficiency and increasing our business, the main asset of all public utility being the good will of the consumer.

The Coal Bill.

I would particularly emphasize that had we curtailed expenditure in building up our business and assets we could have paid a larger dividend, which would, in our opinion, have been a foolish policy, as I should be misleading you if I were not to refer to special dangers that patently threaten the Industry at the present time; I have hardly to tell you that I refer to the provisions of the Coal Bill. Without going into details the fact is that we, in the Gas Industry, are delivered, as I stated in my speech this time last year, as prisoners bound hand and foot into the hands of the colliery owners and the only safeguards against this unregulated monopoly must be regarded as unsatisfactory, in that they are not enforceable.

We know many Governments sanctioned monopolies, our own Industry of gas, electricity, water, the railways, and all are serving the country in a satisfactory manner; but all have their correlative statutory control. They may not exploit the consumer to suit their own sweet will. I would put to you one pregnant question: Has such extraordinary wisdom and sagacity been shown by the colliery proprietors in the past that they are entitled to be put into a position of trust hitherto accorded to no other monopoly in return for vague assurances given by them but having no legal sanction? I submit that there is only one reply to this question.

Coal prices have been put up against us by anything up to 7s. per ton, and unfortunately the coke market, which for a time showed an advance of several shillings, is falling, so that practically the whole of increased coal cost will have to be met in the price of gas.

Competition of Electricity.

It is computed that the cost of general materials has risen by some 17%, and the increase of wages of employees by national awards represents something like an oncost of 6%. The increase in general materials is to some degree offset by the advantage we are able to secure by corporate purchasing, but it is likely that we shall have to raise the price of gas to our consumers in many companies, which will tend to handicap us in the continual struggle for new load which we have to wage with the electricity companies. We do not fear the competition of electricity in the heating field, particularly as it is our intention to introduce sales promotional tariffs throughout our companies.

While speaking of electricity I would like to stress a point that I mentioned in my speech of last year—namely, that the present competition in all fields of activity between electricity and gas is insensate and uneconomic; indeed, I would go so far as to say that, in a wisely regulated community, both gas and electricity would be subjected to a single central authority. There are spheres for which gas—as basic heat—is better adapted than electricity. There are spheres in which electricity—as basic power—is better adapted than gas. But, at the present time, each industry squanders its energy and resources in attempting to deprive the other of its load regardless of any logical considerations. This is a matter that can be solved either by voluntary negotiation of the respective interests or by Government intervention. The former is always the wiser course.

The West Yorkshire Bill.

In the Yorkshire area, where the majority of the privately owned companies are controlled by us, we have taken a share in the new coke ovens in course of erection at Hemsworth Colliery and we have made agreements for the continuous supply of purified gas on equitable terms and we have also arranged to continue to meet the demand of the domestic market by selling prepared oven coke through the medium of our companies. Furthermore, we are the promoters of the West Yorkshire Gas Distribution Bill shortly to come before the House of Lords Committee. This is the largest and, I believe, the most promising scheme ever to have been formulated in this country and, though there is considerable opposition at the present moment, we are hopeful that the measure will commend itself to Parliament as it will enable us to carry our cheap gas throughout the western portion of Yorkshire, where we are interested in no fewer than 19 undertakings, to the benefit of consumer and undertaking alike, while giving the option to other undertakings through whose territories we may be empowered to pass to avail themselves of such cheap supplies of gas in bulk as we may be able to make available to them. I need hardly emphasize the effect this would be likely to have on our industrial load. As the whole matter may be said to be *sub judice*, we must content ourselves with expressing the hope that this beneficent measure may pass into law.

The Chairman's Appreciation.

I cannot close without expressing my appreciation of the work done, first by the chairmen and directors of the various subsidiary companies, secondly by the officials and staff employed therein, thirdly to the hard-worked officials employed under Colonel Carr at the central administration, finally to Colonel Carr and my colleagues on the Board, and in this connexion I wish to inform you that it is my intention to act on a proposal made by two shareholders at our last annual general meeting—namely, to submit to you at this meeting a resolution of which you have had notice so as to bring the remuneration of our directors into a somewhat more reasonable relationship to the time, labour, and responsibility they have now to devote to the affairs of the Corporation.

I am pleased to report that considerable progress has been made in our Caledonian Gas Corporation; the sales of gas for the past year showed an increase of no less than 6·5%. The administration of the Caledonian Corporation has been reorganized and it now operates in parallel with the central administration of this Corporation and shares the benefits of its work and advice.

Importance of Gas.

Finally, before closing, I should like to say just a few words on behalf of the Gas Industry as a whole. It will be a very bad day for this country if obstacles are put in the way of our development when it is borne in mind that not only are we the biggest users of coal, the nation's main basic wealth, but we use that coal in the most economic fashion, and get the greatest amount of by-products from it. We are the friend of every house-

wife, rich or poor, and if, owing to circumstances beyond our control, we are compelled to raise the price for the beneficent service we provide, the hardship will be felt by all and especially by the poor. I repeat, it will be an evil day for the country, and the cause will be exclusively with the coalowners, who will find that they have fallen into that most prevalent commercial error—namely, restricting turnover by inflating sales prices. [Hear, hear.] This is the path to depression and unemployment; let us hope that it will not be further pursued. [Applause.]

I will now ask Colonel Carr to say a few words.

Managing Director's Speech.

Colonel W. MONCRIEFF CARR, O.B.E., T.D. (Managing Director), said: Chairman and gentlemen,—In seconding the proposal I should like, first, to say how delighted we are that the Chairman is able to be with us to-day. [Applause.] He is a very hard and enthusiastic worker in your interests, and I assure you he has done more work even whilst in the nursing home than most of us, and I hope he will give himself at least a little respite before resuming his normal duties.

Secondly, I should like to endorse what our Chairman has said in appreciation of the valuable work carried out by the Directors of our constituent companies and their hard-working and enthusiastic chief officials, and to repeat what I have said previously, that whilst we can achieve much by organizing co-ordinated effort the ultimate success of any particular undertaking is dependent upon its chief official and his staff. It is my desire and that of my Board to maintain and strengthen the position of our Company officials and obtain the maximum benefit from our centralized efforts with their loyal co-operation and support.

Our Chairman has referred to our proposals for the general introduction of sales-promotional tariffs, and I might add that wherever our companies are forced by increased cost of coal to increase their flat-rate charges to consumers generally, they will at the same time offer to all classes of consumers the option of alternative tariffs, which will, in effect, be advantageous to the majority of consumers in each particular class. We are satisfied that by this means our companies will effectively meet any competition not only from electricity in the heating field, but also from other fuels, and effectively increase consumption per consumer.

I would also refer to our proposed linking-up scheme in West Yorkshire. I have always appreciated the great value of industrial load to our Industry, and I think I may fairly claim to have had considerable experience in securing this class of load, and in propounding this scheme I advised my Board that I knew of no area with a greater variety of industries and with greater potentialities for the use of town gas industrially than that which is largely covered by the undertakings we control in West Yorkshire.

With regard to the policy of expansion, our Chairman has clearly indicated that the greatest advantage to company and consumer must result where undertakings are acquired and operated in geographical groups, and, while for obvious reasons we cannot declare our plans, we nevertheless are operating on these lines within the various areas in which we are interested. There is always the danger that other holding companies not operating to such a plan may step in and prevent the attainment of the formation of a most desirable group, and this is a danger which requires the careful consideration of the Industry as a whole.

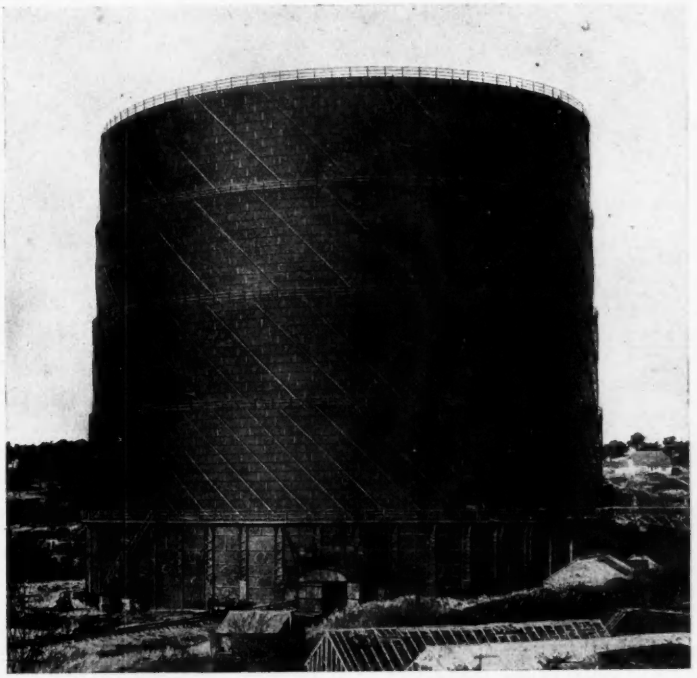
Street Lighting.

With regard to street lighting, there is no question that gas is still a most desirable and important factor and is available for the lighting of the majority of main roads. We have been successful in assisting our companies in securing a good many contracts over long periods of years, and in the area of Denton and Dukinfield I think we can claim to have one of the finest-lit main roads outside the centre of a city area in the country. That demonstration is to Ministry of Transport specification; it is over a distance of 2½ miles, and I think that it constitutes one of the finest street-lighting demonstrations in the country to-day. We have been successful because we have been ready to demonstrate, without encouragement or commitment, for the information of the respective lighting authorities, and it is our intention to continue the closest co-operation with the local authorities in those areas which we serve.

Finally, I, as managing director, express my thanks to my co-directors for their never tiring enthusiasm in the Corporation's affairs and for the enormous amount of work they have undertaken as directors of subsidiary companies, the fees for which pass to the revenues of the Corporation; and to my staff in central administration and the secretaries in London all of whom have worked most loyally and enthusiastically in the Corporation's interests.

The CHAIRMAN then moved the adoption of the report and accounts, and the resolution was seconded by Colonel CARR and carried unanimously.

The dividend as proposed was approved: the retiring Director, Mr. M. H. Tetley, was re-elected, and the Auditors, Messrs. Deloitte, Plender, Griffiths, & Co., were re-appointed.



AT BOURNEMOUTH—CAPACITY 5 MILLION CUBIC FEET.

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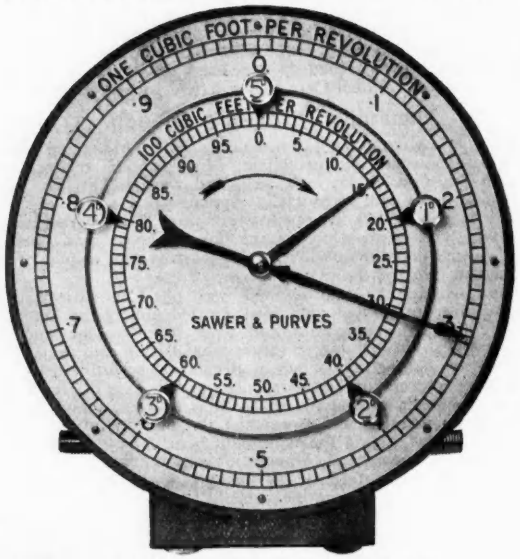

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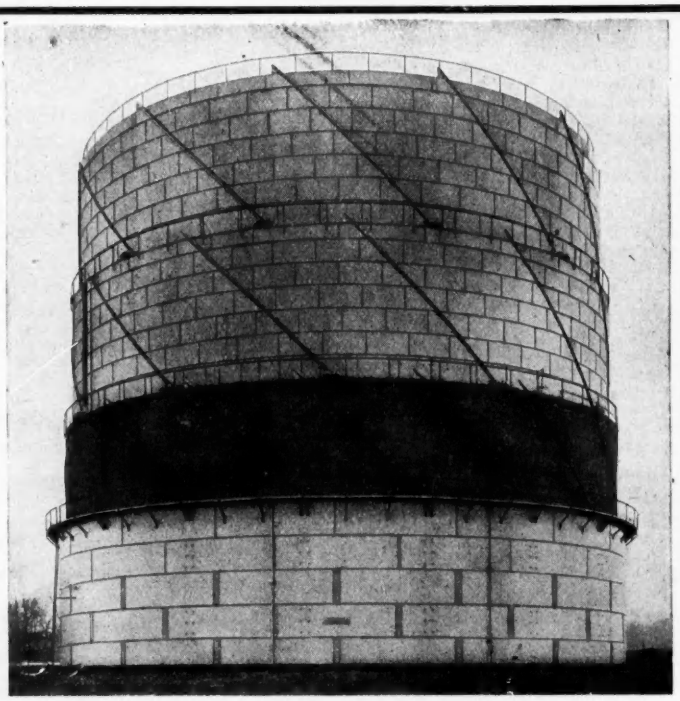

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458

Markets and Manufactures

Current Sales of Gas Products

The London Market

April 25.

To-day's prices of Tar Products in the London market are as follows:

Pitch, nominal at about 33s. per ton f.o.b.

Creosote, about 5½d.

Refined tar, 3¾d.

Pure toluole, 2s. 1d. to 2s. 2d.

Pure benzole, 1s. 8d.

95/160 solvent naphtha, 1s. 7d.

90/160 pyridine, 10s. to 11s.

All per gallon naked at makers' works.

The Provinces

April 25.

Crude Gas-Works Tar, 20s. to 25s.

To avoid misunderstanding, it is necessary to state that the above price is not claimed to represent a market value. It is a price worked out from week to week upon a system which has been used for many years as a basis for the fixing of certain contracts for crude tar of varying qualities in different areas.

The average prices of gas-works products during the week were: Pitch—East Coast, 33s. to 34s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 33s. to 34s.* Toluole, naked, North, 1s. 7½d. to 1s. 9d. Coal tar, crude naphtha, in bulk, North, 7¾d. to 8¼d. Solvent naphtha, naked, North, 1s. 4½d. to 1s. 5d. Heavy naphtha, North, 1s. 3d. to 1s. 3½d. Creosote, *ex* works, in bulk, North, liquid and salty, 4⅞d. to 5¼d.; low gravity, 4½d. to 4¾d. Heavy oils, in bulk, North, 5d. to 5¼d. Carbolic acid 60's, 3s. to 3s. 3d. Naphthalene, £13 10s. to £16. Salts, 80s. to 85s., bags included. Anthracene, "A" quality, 4½d. to 4¾d. per minimum 40% purely nominal; "B" quality unsalable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Scotland

GLASGOW, *April* 23.

Business continues very dull with quotations remaining easy in all departments.

Crude gas-works tar.—Actual value remains at 37s. to 38s. per ton *ex* works in bulk.

Pitch remains weak with f.o.b. value called round 26s. to 27s. per ton, and home price called about 25s. to 26s. per ton *ex* works in bulk.

Refined tar.—Distillers are anxious for orders but home price remains at 3¾d. to 4d. per gallon f.o.r. naked. Export quotations are also unchanged at 3d. to 3¼d. per gallon in buyers' packages at makers' works.

Creosote oil.—New business is difficult but distillers are comfortably placed and prices are fairly steady as under: Specification oil, 5d. to 5¼d. per gallon; low gravity, 6¼d. to 6½d. per gallon; neutral oil, 5d. to 5¼d. per gallon; all *ex* works in bulk.

Cresylic acid.—Business is decidedly slow and prices are more or less nominal as follows: Pale, 97/99%, 2s. 3d. to 2s. 6d. per gallon; dark, 97/99%, 2s. to 2s. 3d. per gallon; and pale, 99/100%, 2s. 6d. to 2s. 8d. per gallon; all according to quality, *ex* works in buyers' packages.

Crude naphtha is easier at 5¾d. to 6¼d. per gallon *ex* works in bulk, according to quality.

Solvent naphtha remains difficult. 90/160 grade is lower at 1s. 4d. to 1s. 5d. per gallon, and 90/190 heavy naphtha is 1s. 1d. to 1s. 1½d. per gallon.

Motor benzole is valued at 1s. 4d. to 1s. 4½d. per gallon.

Pyridine.—90/160 grade is 10s. 6d. to 11s. 6d. per gallon, and 90/140 grade 11s. 6d. to 12s. 6d. per gallon.

Benzole Prices

These are considered to be the market prices for benzole at the present time:

	s.	d.	s.	d.			
Crude benzole..	0	9	to 0	9½	per gall.	at works	
Motor „ ..	1	2½	„ 1	3	„	„	„
90% „ ..	1	3½	„ 1	4	„	„	„
Pure „ ..	1	7½	„ 1	8	„	„	„

Contracts Advertised To-Day

Coal.

City of Lincoln Gas Department. [p. 258.]
Tipton Gas Department. [p. 258.]

Coke Hopper.

Burton-upon-Trent Gas Department. [p. 258.]

Lighting Requisites (Indoor and Outdoor).

Southport Gas Department. [p. 257.]

Mantles.

Birmingham Corporation. [p. 258.]

Meters.

Birkenhead Gas Department. [p. 258.]
Southport Gas Department. [p. 257.]

Paints, &c.

Birkenhead Gas Department. [p. 258.]
Birmingham Corporation. [p. 258.]

Pipes, Fittings, and Specials.

Birkenhead Gas Department. [p. 258.]
Birmingham Corporation. [p. 258.]
Southport Gas Department. [p. 257.]

Resetting Retorts.

Bingley U.D.C. Gas Department. [p. 257.]

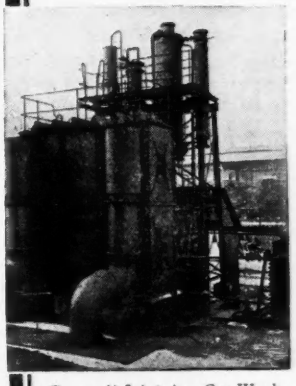
Steam Raising Plant.

Wallasey Gas Department. [p. 258.]

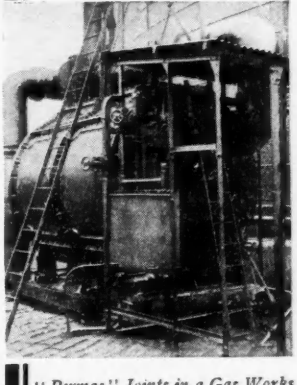
Stores.

Birkenhead Gas Department. [p. 258.]
Birmingham Corporation. [p. 258.]
Southport Gas Department. [p. 257.]

25 Years' Hard!



"Permac" Joints in a Gas Works.



"Permac" Joints in a Gas Works.

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Carbonizing plants of West manufacture to the total of 422 have been built or are now on order, distributed over 24 countries.

THE SOCIETY OF BRITISH GAS INDUSTRIES · 1905 ·

GLOVER-WEST VERTICALS

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WEST'S GAS IMPROVEMENT CO. LTD.,

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GAS STOCKS AND SHARES

The Stock Exchange three weeks' Account closed on Friday last with a quiet but confident undertone. Business during the week was not very heavy, but this could be expected on the eve of the Budget. By the time these notes are in print we shall know the best or the worst in this direction.

A slightly easier tendency developed in gilt-edged securities and several closed fractionally lower, while home rails behaved similarly by reason of the somewhat disappointing Easter traffic returns. Industrials were fairly active, and although some profit taking was in evidence many issues finished higher than a week ago. An increase in the price of the commodity gave a fillip to rubber shares, and the mining market was active on French support.

The Gas market opened quietly but became more animated as the week progressed, and several upward movements in price were recorded. The feature was the continued rise in Imperial Continental, which has gained 18 points during the past ten days and closed at 135½. Gas Light units strengthened again and went 6d. higher to 23s. 9d., and Wandsworth ordinary hardened 2 points to 139½. The only setback in the Official List was a drop of 1s. in South-Eastern Gas Corporation £1 ordinary shares. On the Provincial Exchanges Bristol ordinary closed a point higher at 116, while the nominal quotations in the Supplementary List remained unchanged.

The accounts of the Bombay Gas Company for the year to Dec. 31 last were again very satisfactory. The revenue account shows a profit of £24,036 (against £22,847), and after adding the profit on exchange, £6,559, and the balance of £45,764 brought in, there is an amount of £76,359 available. After providing for interest, transferring £2,556 to reserve, £507 to the renewal and contingency fund, and allowing £2,048 for depreciation of investments, the Directors recommend the payment of a final dividend of 4½%, making 8% for the year (the rate distributed for the previous seven years), leaving £46,364 to be carried forward. The £1 shares are now *ex div.* at about 26s. 6d. against last year's highest 27s. 7½d. and lowest 25s. 3d., and at the present price the yield works out at a little over 6%.

Official Quotations on the London Stock Exchange

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Apl. 22.	Rise or Fall on Week.
1,767,439	Mar. 7	8	8	Alliance & Dublin Ord. ...	140—150	...
374,000	Dec. 13	4	4	Do. 4 p.c. Deb. ...	95—100	...
558,190	Nov. 15	5	5	Asscd. Gas & Water U'd'ts Ord.	18/—20/–	...
500,000	,,	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	19/—21/-	...
216,041	,,	—	§-/4	Do. 4 p.c. Red. Cum. Pref.	19/—20/–	...
278,590	,,	§-/2¾	4	Do. 4 p.c. Irred. Cum. Pref.	17/—19/–	...
500,000	Mar. 7	3½	3½	Do. 3½ p.c. Red. Deb. ...	94—99	...
558,890	Feb. 21	7	7	Barnet Ord. 7 p.c.	158—163	...
300,000	Apl. 4	1/4½	1/9¾	Bombay, Ltd.	25/—28/–*	...
179,915	Feb. 21	9½	9½	Bournemouth sliding scale ...	195—205	...
590,407	,,	7	7	Do. 7 p.c. max. ...	157—162	+1
493,960	,,	6	6	Do. 6 p.c. Pref. ...	132—137	...
50,000	Dec. 13	3	3	Do. 3 p.c. Deb. ...	78—83	...
262,025	,,	4	4	Do. 4 p.c. Deb. ...	98—103	...
335,000	,,	5	5	Do. 5 p.c. Deb. ...	115—120	...
357,900	Feb. 21	7½	7½	Brighton, &c., 6 p.c. Con. ...	145—150	...
649,955	,,	6½	6½	Do. 5 p.c. Con. ...	128—133	...
205,500	,,	6	6	Do. 6 p.c. 'B' Pref.	125—130	...
855,000	Mar. 7	7	8	British Ord.	138—143	...
100,000	Dec. 13	7	7	Do. 7 p.c. Pref.	142—147	...
350,000	,,	5½	5½	Do. 5½ p.c. 'B' Cum. Pref.	110—115	...
120,000	,,	4	4	Do. 4 p.c. Red. Deb. ...	95—100	...
450,000	,,	5	5	Do. 5 p.c. Red. Deb. ...	102—107	...
450,000	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	95—100	...
100,000	22 May'33	6	4	Cape Town, Ltd.	1¼—2¼	...
100,000	6 Nov.'33	4½	4½	Do. 4½ p.c. Pref. ...	1¼—3¼	...
150,000	Dec. 13	4½	4½	Do. 4½ p.c. Deb. ...	65—75	...
626,860	Feb. 7	6	6	Cardiff Con. Ord.	120—125	...
237,860	Dec. 13	5	5	Do. 5 p.c. Red. Deb.	106—111	...
98,936	Mar. 21	2/-	2/-	Colombo Ord....	1⅝—1¾	...
24,510	,,	1/4½	1/4½	Do. 7 p.c. Pref.	23/—25/–	...
739,453	Mar. 21	-/11·48	-/11·48	Colonial Gas Assn. Ltd. Ord.	16/6—18/6	...
296,144	,,	1/3·30	1/3·30	Do. 8 p.c. Pref.	21/6—23/6	...
1,775,005	Feb. 7	5	5	Commercial Ord.	83—88	...
620,000	Nov. 29	3	3	Do. 3 p.c. Deb. ...	73—78	...
286,344	Feb. 7	5	5	Do. 5 p.c. Deb. ...	113—118	...
807,560	Feb. 21	7	7	Croydon sliding scale... ...	137—142	...
644,590	,,	5	5	Do max. div.	107—112	...
620,385	Dec. 13	5	5	Do. 5 p.c. Deb.	115—120	...
239,000	Feb. 7	5	5	East Hull Ord. 5 p.c.... ...	96—101	...
185,355	Feb. 21	6	6	East Surrey Ord. 5 p.c. ...	118—123	...
176,211	Dec. 13	5	5	Do. 5 p.c. Deb. ...	112—117	...
250,000	Nov. 15	7	4	Gas Consolidation Ord. ...	19/—21/–	...
250,000	,,	4	4	Do. 4 p.c. Red. Cum. Pref.	18/—20/–	...
19,223,324	Feb. 7	5⅜	5⅜	Gas Light & Coke Ord. ...	23/3—24/3a	+-/6
2,600,000	,,	3½	3½	Do. 3½ p.c. max. ...	81—84	...
4,477,106	,,	4	4	Do. 4 p.c. Con. Pref.	99—102	...
2,993,000	Jan. 17	...	3½	Do. 3½ p.c. Red. Pref.	100½—102½	...
8,602,497	Nov. 29	3	3	Do. 3 p.c. Con. Deb.	78—81	...
3,642,770	,,	5	5	Do. 5 p.c. Red. Deb.	112—115	...
3,500,000	,,	4½	4½	Do. 4½ p.c. Red. Deb.	110—113	...
700,000	Mar. 7	3½	3½	Do. 3½ p.c. Red. Deb.	97—100	...
270,466	Feb. 21	6	6	Harrogate New Cons. ...	118—123	...
157,500	Mar. 21	1/2⅜	1/‡	Hong Kong and China Ord	⅜—1*	...
213,200	Feb. 7	6	6	Hornsey Con. 3½ p.c. ...	105—115	...
5,600,000	Nov. 1	12	8	Imperial Continental Cap. ...	133—138	+18
223,130	Jan. 17	3½	3½	Do. 3½ p.c. Red. Deb. ...	88—93	...
285,242	Feb. 21	8½	8½	Lea Bridge 5 p.c. Ord. ...	167—172	...
11,751	Feb. 21	8	10	Maidstone 5 p.c. Cap.... ...	175—185	...
63,480	Dec. 13	3	3	Do. 3 p.c. Deb. ...	70—75	...
75,000	Nov. 29	†10	†10	Malta & Mediterranean ...	142—147	...
392,000	Apl. 1	5½	5½	Metropolitan (of Melbourne) 5½ p.c. Red. Deb.	99—102*	...
231,977	Feb. 21	5	5	M.S. Utility 'C' Cons. ...	99—104	...
968,658	,,	4	4	Do. 4 p.c. Cons. Pref.	95—100	...
360,075	Dec. 13	4	4	M.S. Utility 4 p.c. Deb. ...	97—102	...
148,955	,,	5	5	Do. 5 p.c. Deb. ...	113—118	...
675,000	Nov. 15	†9	†6	Montevideo, Ltd.	73—78	...
250,000	Mar. 7	7½	7½	North Middlesex 6 p.c. Con.	145—150	...
396,160	Feb. 7	5	5	Northampton 5 p.c. max. ...	105—110	...
300,000	Oct. 18	†7	†9	Oriental, Ltd.	153—158	...
468,537	Dec. 13	8	8	Plymouth & Stonehouse 5 p.c.	154—159	...
621,667	Feb. 7	8½	8½	Portsmouth & Gosport Cons.	160—165	...
241,446	,,	5	5	Do. 5 p.c. max. ...	102—107	...
73,350	,,	5	5	Do. 5 p.c. Pref. ...	108—113	...
247,966	Dec. 13	4	4	Primitiva 4 p.c. Cons. Deb. ...	98—103	...
625,959	Jan. 17	4	4	Do. 4 p.c. Red. Deb. ...	95—100	...
15,000	Mar. 21	6	6	San Paulo 6 p.c. Cum. Pref. ...	8½—9½	...
441,275	Sept. 20	1/1½	1/1½	Severn Val. Gas Cor. Ld. Ord.	21/—23/–	...
460,810	Mar. 21	-/10½	-/10½	,, ,, 4½ p.c. Cum. Pref.	19/6—21/6	+-/6
133,201	Feb. 7	8½	5	Shrewsbury 5 p.c. Ord. ...	128—133	...
9,000	June 7	4	4	South African Ord.	3¾—4¾	...
1,371,752	Sept. 6	1/2⅞	1/2⅞	South East'n Gas Cn. Ld. Ord.	22/—24/–	—1/–
871,636	Mar. 7	-/10½	-/10½	Do. 4½ p.c. Red. Cum. Pref.	20/—22/–	...
498,818	,,	4	4	Do. 4 p.c. Cum. Pref. ...	18/—20/–	...
450,000	Feb. 7	4	4	Do. 4 p.c. Deb.	100—103	...
150,000	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	95—98	...
6,709,895	Feb. 7	6	5	South Met. Or.d.	104—107	...
1,135,812	,,	6	6	Do. p.c. Irred. Pf. ...	130—135	...
850,000	,,	4	4	Do. 4 p.c. rred. Pf. ...	97—100	...
1,895,445	Dec. 13	3	3	Do. 3 pc. IDeb. ...	78—81	...
1,000,000	Jan. 17	5	5	Do. 5 p.c. Red. Deb....	109—112	...
1,543,795	Feb. 7	6	6	South Suburban Ord. 5 p.c....	118—123	...
512,825	,,	5	5	Do. 5 p.c. Pref....	110—115	...
500,000	,,	4	4	Do. 4 p.c. Pref....	95—100	...
250,000	,,	§18/9	3¾	Do. 3¾ p.c. Red. Pref.	98—101	...
888,587	Dec. 13	5	5	Do. 5 p.c. Deb....	115—120	...
250,000	,,	4	4	Do. 4 p.c. Deb....	97—100	...
200,000	Sept. 20	...	3½	Do. 3½ p.c. Red. Deb.	94—99	...
427,859	Nov. 1	1/2½	9½	S. Western Gas & Water Ord.	18/6—20/6	...
160,523	,,	-/10½	-/10½	Do. 4½ p.c. Red. Cum. Pf.	19/6—21/6	...
110,000	Dec. 13	4	4	Do. 4 p.c. Red. Deb. ...	97—102	...
750,541	Feb. 7	5	5½	Southampton Ord. 5 p.c. ...	109—114	...
148,836	Dec. 13	4	4	Do. 4 p.c. Deb.	96—101	...
350,000	Feb. 7	5½	5½	Swansea 5½ p.c. Red. Pref. ...	108—113	...
94,000	Jan. 3	3½	3½	Do. 3½ p.c. Red. Deb. ...	95—100	...
1,076,490	Feb. 7	6½	6½	Tottenham and District Ord.	126—131	...
409,835	,,	5½	5½	Do. 5½ p.c. Pref....	119—124	...
62,235	,,	5	5	Do. 5 p.c. Pref....	108—113	...
371,850	Dec. 13	4	4	Do. 4 p.c. Deb....	97—102	...
85,701	July 19	‡6	6	Tuscan 6 p.c. Red. Deb. ...	96—101	...
888,629	Apl. 4	4	6	U. Kingdom Gas Cor. Ord....	18/6—20/6*	...
937,743	Nov. 15	4½	4½	Do. 4½ p.c. 1st Cum. Pref.	19/6—21/6	...
500,000	,,	...	-/1·15	Do. 4 p.c. 1st Red. Cum. Pf.	19/—21/-	...
745,263	Dec. 13	4½	4½	Do. 4½ p.c. 2nd Non-Cum.Pf.	16/6—18/6	...
1,000,000	Mar. 7	3½	3½	Do. 3½ p.c. Red. Deb. ...	96—99	...
373,939	Feb. 7	7	7	Uxbridge, &c., 5 p.c.	133—138	...
133,01	,,	5	5	Do. 5 p.c. Pref. ...	108—113	...
1,371,138	Feb. 7	7	7	Wandsworth Consolidated ...	137—142	+2
2,525,768	,,	4	4	Do. 4 p.c. Pref. ...	96—101	...
1,343,964	Dec. 13	5	5	Do. 5 p.c. Deb. ...	116—121	...
383,745	,,	4	4	Do. 4 p.c. Deb. ...	98—103	...
558,342	Feb. 7	7	7	Watford and St. Albans Ord.	135—140	...
200,000	,,	5	5	Do. 5 p.c. Pref. ...	110—115	...
200,000	,,	5½	5½	Do. 5½ p.c Pref. ...	120—125	...
200,000	Nov. 29	4	4	Do. 4 p.c. Red. Deb.	97—102	...
100,000	,,	3½	3½	Do. 3½ p.c. Red. Deb.	95—100	...

a.—The quotation is per £1 of stock. * Ex. div. † Paid free of income-tax ‡ For year. § Actual.

Supplementary List and Provincial Exchanges overleaf.

STOCK AND SHARE LIST—Cont.

Supplementary List, not Officially Quoted, London

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Apl. 22.	Rise or Fall on Week.
202,152	Mar. 21	5	5	Ascot Ord.	103—108	...
128,182	Dec. 13	5	5	Do. 5 p.c. Pref.	108—113	...
31,035	Mar. 21	...	-/4½	Associated Utilities 4 p.c. Pref.	16/—18/-	...
100,000	Dec. 13	...	3½	Do. 3½ p.c. Red. Deb....	95—100	...
17,000	Feb. 21	8	8	Bognor Orig. Ord. 'A' ...	155—165	...
62,210	,,	8	8	Do. New Addl. 'A' ...	155—165	...
87,160	,,	7	7	Do. New 7 p.c. max. ...	152—157	...
37,440	Feb. 7	10	10	Cam. Univ. & Town10 p.c. max.	190—200	...
125,970	,,	7	7	Do. 7 p.c. max.	135—140	...
39,025	,,	5	5	Do. 5 p.c. max.	97—102	...
96,410	Feb. 7	4½	4½	Cardiff 4½ p.c. Pref.	95—100	...
150,000	Feb. 21	4	4	Croydon 4 p.c. Pref.	95—100	...
130,000	Dec. 13	4	4	Do. 4 p.c. Deb.	97—102	...
65,000	Mar. 7	7½	8½	Eastbourne 'A' 5 p.c. ...	155—160	...
198,000	,,	6	7	Do. 'B' 3½ p.c.	126—131	...
112,312	,,	5	5	Do. 5 p.c. Pref.	107—112	...
130,000	Dec. 13	5	5	Do. 5 p.c. Deb.	113—118	...
24,000	Feb. 21	8½	8½	Great Yarmouth 8½ p.c. max.	43—48	...
59,400	,,	7½	7½	Do. 7½ p.c. max.	33—38	...
51,160	Dec. 13	5½	5½	Do. 5½ p.c. Deb.	120—125	...
152,600	Feb. 21	8	9	Guildford Cons.	167—172	...
54,055	,,	5	5	Do. 5 p.c. Pref.	108—113	...
68,250	Dec. 13	5	5	Do. 5 p.c. Deb.	112—117	...
156,600	Feb. 21	7½	7½	Hampton Court Cons. ...	142—152	...
80,000	Feb. 21	4	4	Lea Bridge 4 p.c. Pref ...	94—99	...
60,000	,,	6	6	Do. 6 p.c. Pref. ...	123—128	...
94,876	Dec. 13	4	4	Do. 4 p.c. Deb. ...	97—100	...
73,620	Mar. 7	8¾	8¾	Luton Cons. 'A'	160—165	...
107,960	Mar. 21	4	5½	Mid Kent Ord.	8¾—9¼	...
230,940	Feb. 7	10	10	Oxford & District Ord. ...	202—207	...
47,112	,,	5	5	Do. 5 p.c. Pref.	106—111	...
50,000	,,	6	6	Do. 6 p.c. Red. Pref. ...	108—113	...
126,193	Nov. 15	7½	7½	Peterborough Ord.	158—163	...
64,990	Mar. 7	6½	7½	Redditch Ord....	122—132	...
166,850	Feb. 7	8	8	Romford Ord....	148—153	...
60,000	,,	4	4	Do. 4 p.c. Pref.	97—100	...
44,000	Mar. 21	5	5	Do. 5 p.c. Deb.	111—116	...
25,570	Feb. 7	5½	5½	Rugby 5½ p.c. Pref.	123—128	...
25,000	,,	6	6	Do. 6 p.c. Red. Pref. ...	103—108	...
42,750	Dec. 13	5½	5½	Do. 5½ p.c. Deb.	120—125	...
10,950	Feb. 21	8	8	Ryde Ord.	140—150	...
270,086	Mar. 21	7	7	Slough Ord.	128—133	...
21,000	Dec. 13	5	5	Do. 5 p.c. Deb.	110—115	...
28,872	Nov. 1	5½	5½	S. Midland Gas Cpn. Ltd. Ord.	19/—21/-	...
28,866	Mar. 7	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	18/6—20/6	...
137,730	Feb. 21	7	7	Southgate & Dist. 7 p.c. max.	135—140	...
62,500	,,	5	5	Do. 5 p.c. Pref.	110—115	...
117,228	Feb. 7	5	7	Swindon Cons.	104—109	...
60,425	Dec. 13	5	5	Do. 5 p.c. Deb.	110—115	...
64,380	Dec. 13	5	5	Torquay and Paignton 5 p.c. Pf.	108—113	...
33,858	Nov. 15	...	-/2·70b	United Kingdom Gas Corpn. 4½ p.c. 1st Cum. Pref. ...	18/—20/-	...
130,000	Feb. 7	5	8	Wakefield Ord.	118—123	...
81,650	,,	5	5	Do. 5 p.c. max.	101—106	...
82,000	Feb. 21	6	6	Weymouth Ord.	105—110	...
98,384	Feb. 7	6	6	Wolverhampton 6 p.c. Pref....	118—123	...
160,000	Dec. 13	5½	5½	Do. 5½ p.c. Rd. Db.	107—112	...
90,000	Dec. 13	5	5	York 5 p.c. Red. Deb.... ...	104—109	...
133,640	Feb. 21	6½	6½	Yorktown (Cam.) 5 p.c. Cons.	126—131	...
120,000	,,	5	5	Do. 5 p.c. Pref.	106—111	...
35,000	Dec. 13	5½	5½	Do. 5½ p.c. Deb.	121—126	...

BRISTOL EXCHANGE

Issue.	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations, Apl. 22.	Rise or Fall on Week.
347,756	Feb. 7	5	6	Bath Cons.	120—122	...
1,667,250	Feb. 7	5	5	Bristol, 5 p.c. max.	115—117	+1
120,420	Dec. 13	4	4	Do. 1st 4 p.c. Deb. ...	100—102	...
217,870	,,	4	4	Do. 2nd 4 p.c. Deb. ...	100—102	...
328,790	,,	5	5	Do. 5 p.c. Deb.	119—122	...
274,000	Feb. 21	5	5	Newport (Mon.) 5 p.c. max....	99—101	...
13,200	Mar. 21	7	8½	Pontyp'l Gas & W. 10 p.c. 'A'	12½—13½	...
13,600	,,	5	6	Do. 7 p.c. 'B'	11½—12½	...
40,000	,,	5	6	Do. 7 p.c. 'C'	11½—12½	...
140,778	Feb. 7	5	5	Weston-super-Mare Cons. ...	110—112	...
64,338	Jan. 3	4	4	Do. 4 p.c. Deb.	94½—96½	...
33,340	,,	7½	7½	Do. 7½ p.c. Deb.	154—157	...

LIVERPOOL EXCHANGE

Issue.	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations, Apl. 22.	Rise or Fall on Week.
157,150	Feb. 7	5	6½	Chester 5 p.c. Ord.	103½—107½	...
92,500	Dec. 13	4	4	Do. 4 p.c. Pref.	96—100	...
36,430	,,	3½	3½	Do. 3½ p.c. Deb.	88—91	...
41,890	,,	4	4	Do. 4 p.c. Red. Deb. ...	97—101	...
2,167,410	Feb. 21	6	6	Liverpool 5 p.c. Ord.... ...	124—125	...
245,500	Dec. 13	5	5	Do. 5 p.c. Red. Pref. ...	99—104	...
306,083	Jan. 17	4	4	Do. 4 p.c. Deb. ...	100—102	...
106,280	Feb. 7	10	10	Preston 'A' 10 p.c.	202—212	...
188,219	,,	7	7	Do. 'B' 7 p.c.	144—154	...

NEWCASTLE EXCHANGE

Issue.	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations, Apl. 22.	Rise or Fall on Week.
122,577	Feb. 21	8	8	Blyth 5 p.c. Ord.	163½—164½	...
732,000	Feb. 21	5	5	Hartlepool G. & W. Cn. & New	110—112	...
2,061,315	Feb. 7	5	5¾	Newcastle & Gateshead Con.	22/9—23/3a	...
682,856	,,	4	4	Do. 4 p.c. Pref. ...	99—100	+½
776,706	Jan. 3	3½	3½	Do. 3½ p.c. Deb. ...	91½—92½	...
277,285	Nov. 1	5	5	Do. 5 p.c. Deb. '43...	103—105	...
332,351	Feb. 7	6	6	Sunderland 6 p.c. max. ...	137—139	...

NOTTINGHAM EXCHANGE

Issue.	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations, Apl. 22.	Rise or Fall on Week.
542,270	Feb. 21	6	9	Derby Con.	135—145	...
55,000	Dec. 13	4	4	Do. 4 p.c. Deb.	100—105	...
20,000	Dec. 13	5	5	Long Eaton 5 p.c. Pref.	10—12	...
80,000	,,	5	5	Do. 5 p.c. Deb. ...	105—110	...

SHEFFIELD EXCHANGE

Issue.	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations, Apl. 22.	Rise or Fall on Week.
10,000	Feb. 21	10	10	Great Grimsby 'A' Ord. ...	205—215	...
6,500	,,	10	10	Do. 'B' Ord. ...	205—215	...
79,000	,,	10	10	Do. 'C' Ord. ...	195—205	...
1,806,339	Feb. 21	6½	6½	Sheffield Cons.	139—142	...
95,000	Jan. 3	4	4	Do. 4 p.c. Deb.	102—104	+1½

a The quotation is per £1 of Stock. *b* Actual. * Ex div.

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